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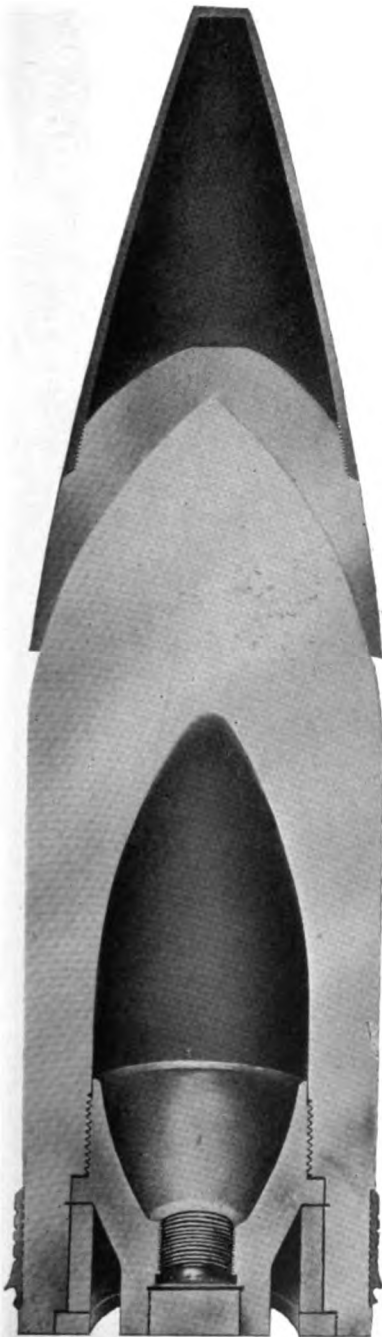
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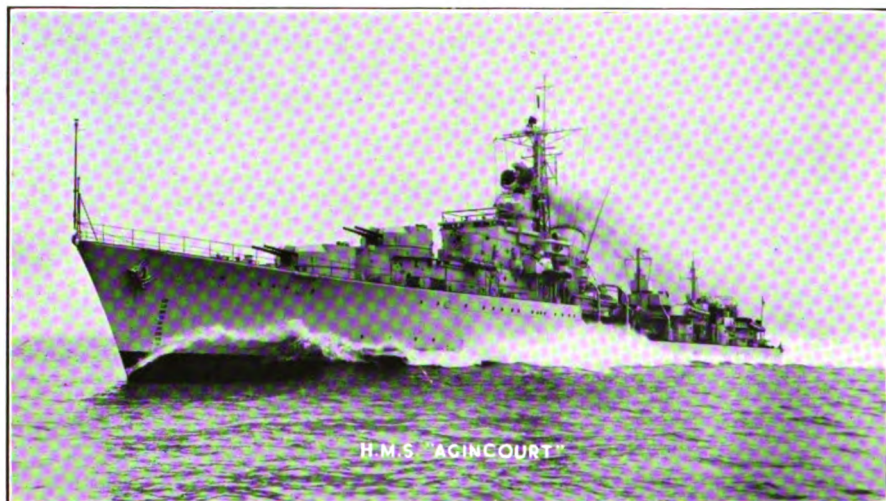
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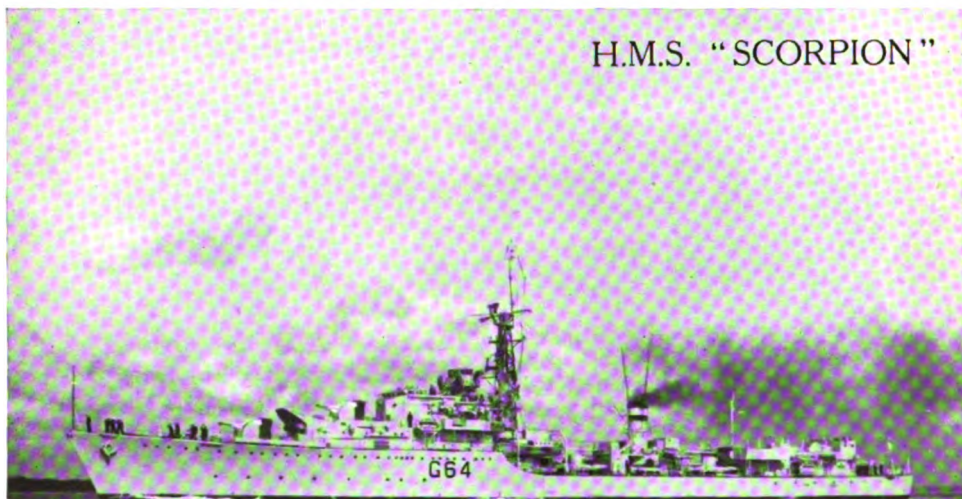
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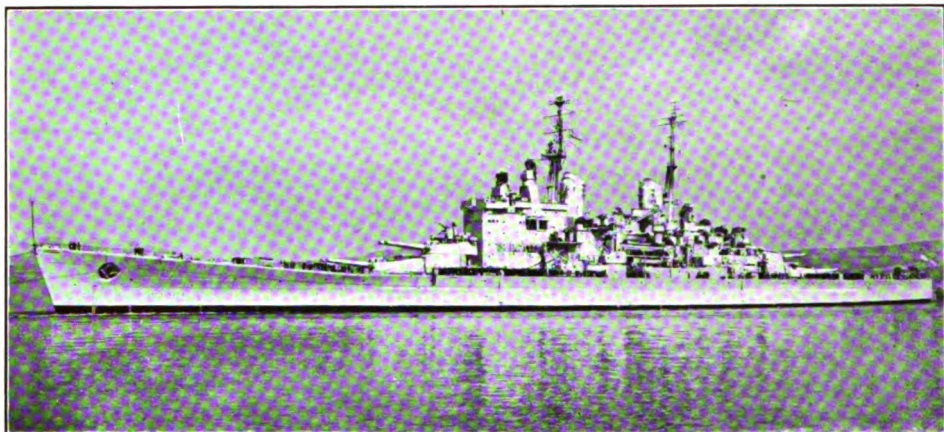
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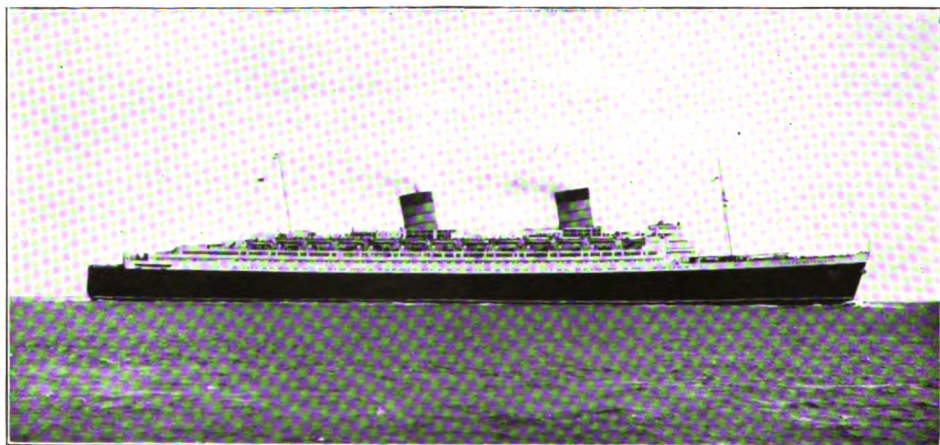
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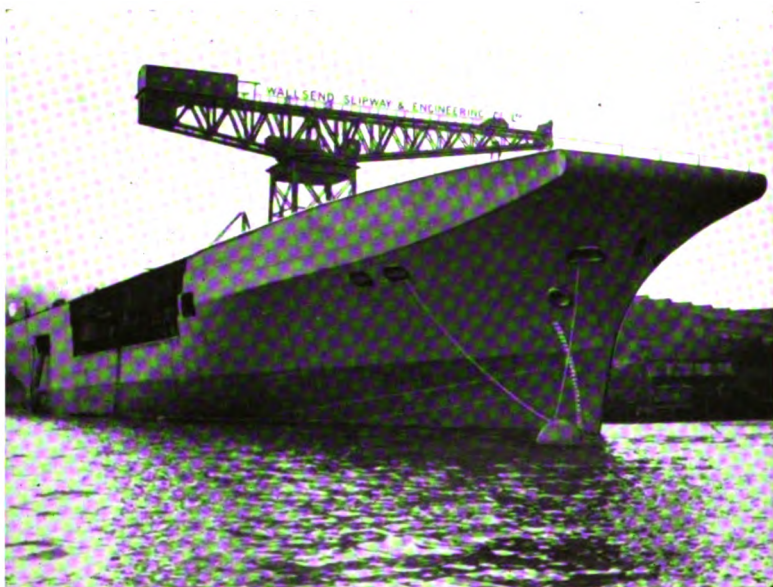
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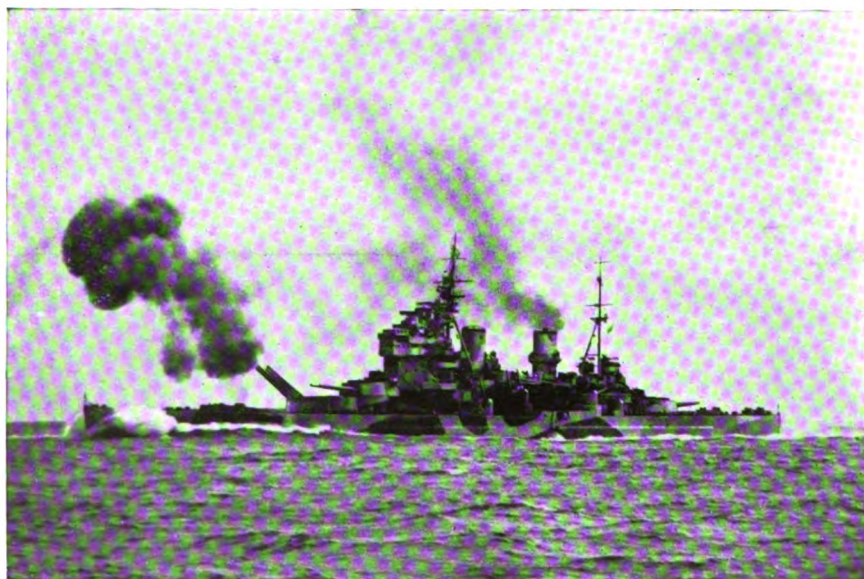
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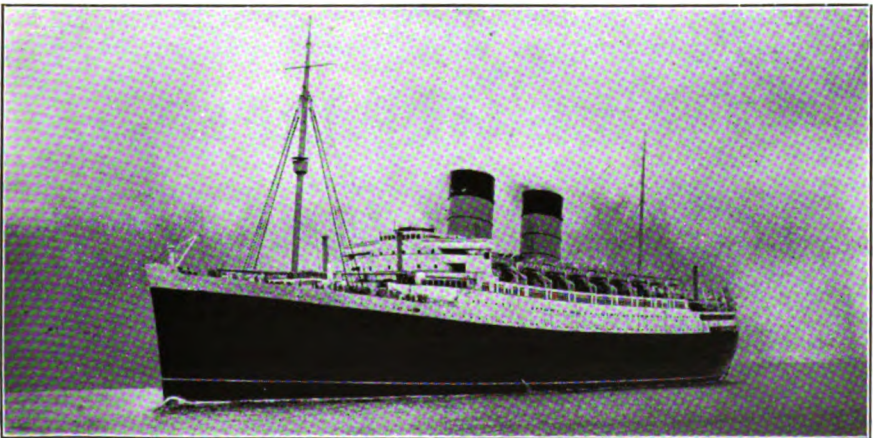
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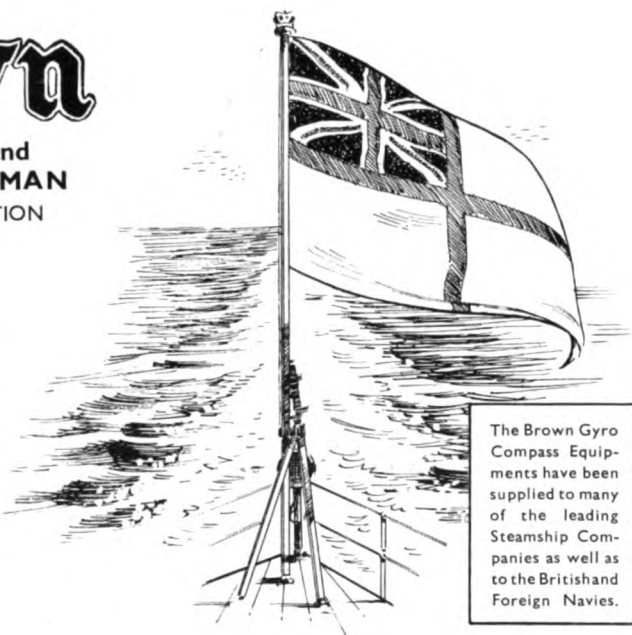
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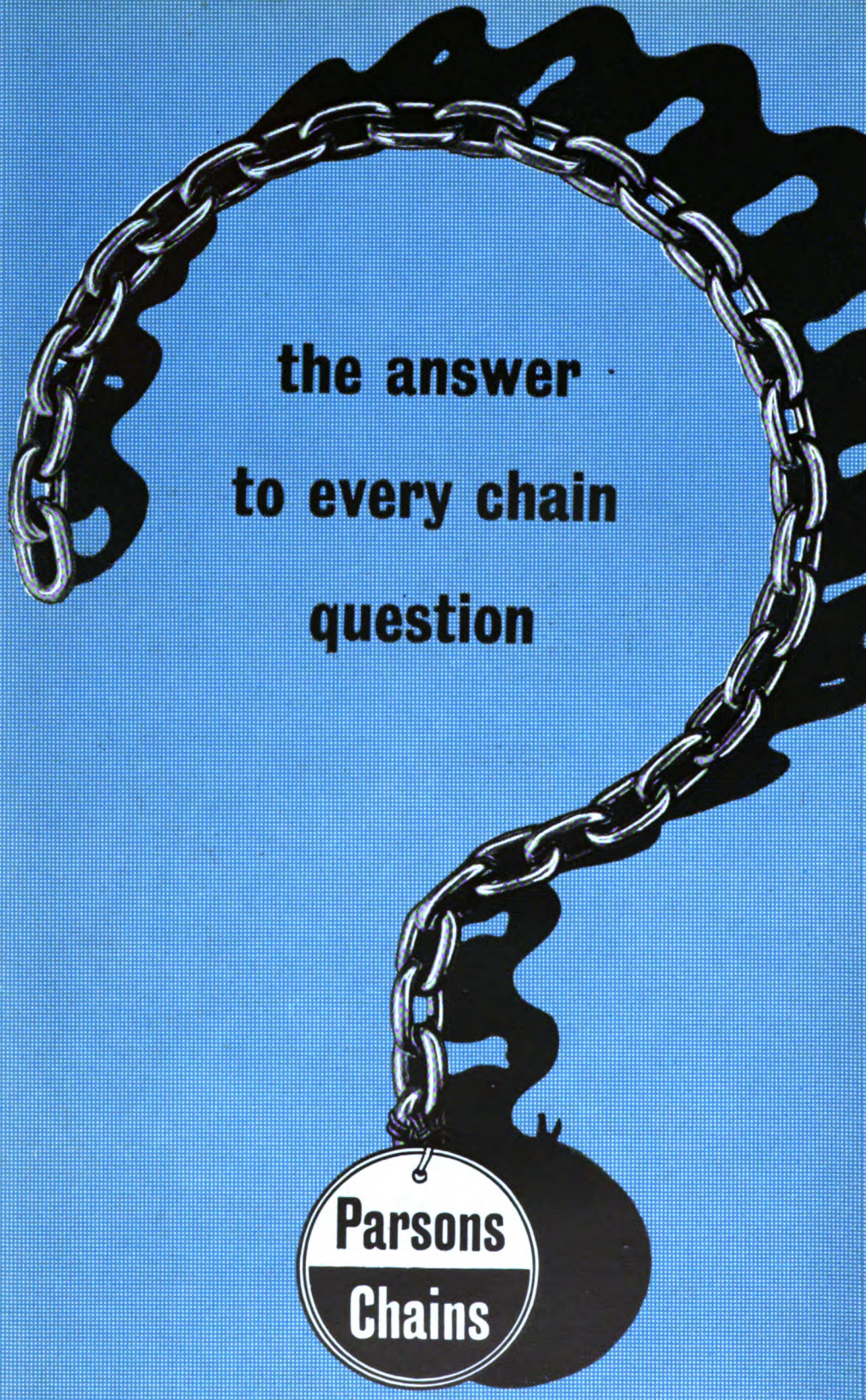


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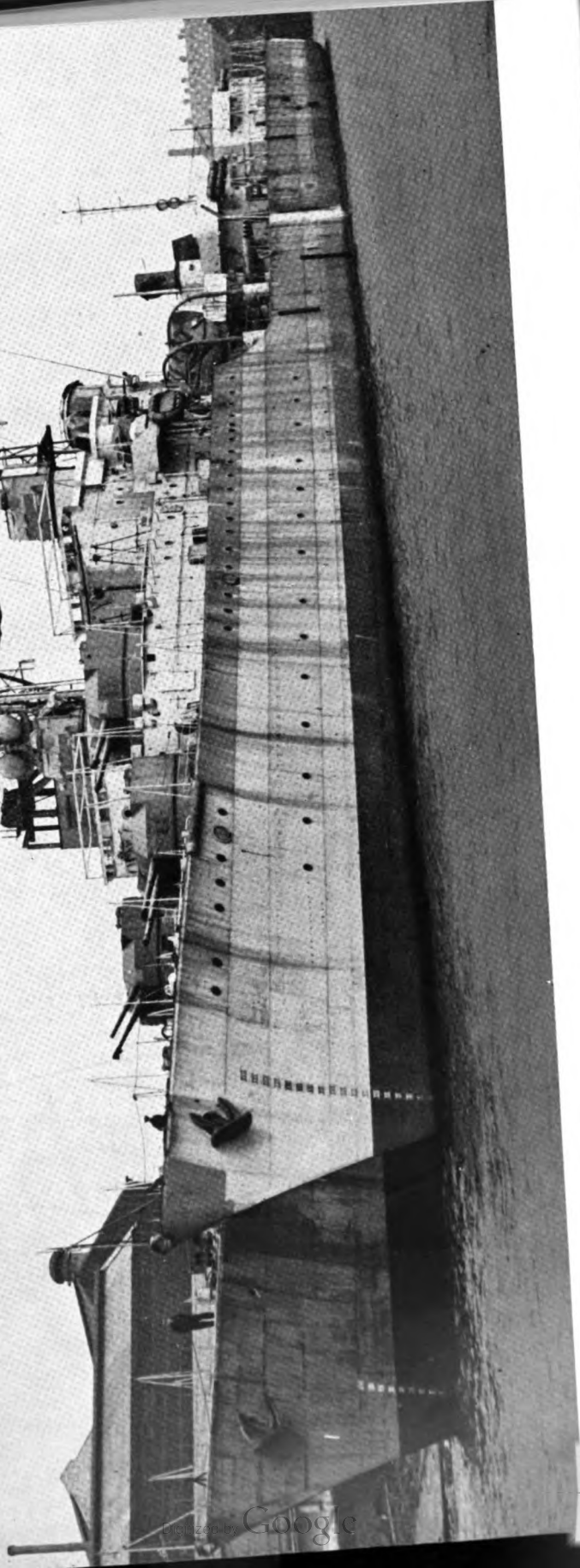
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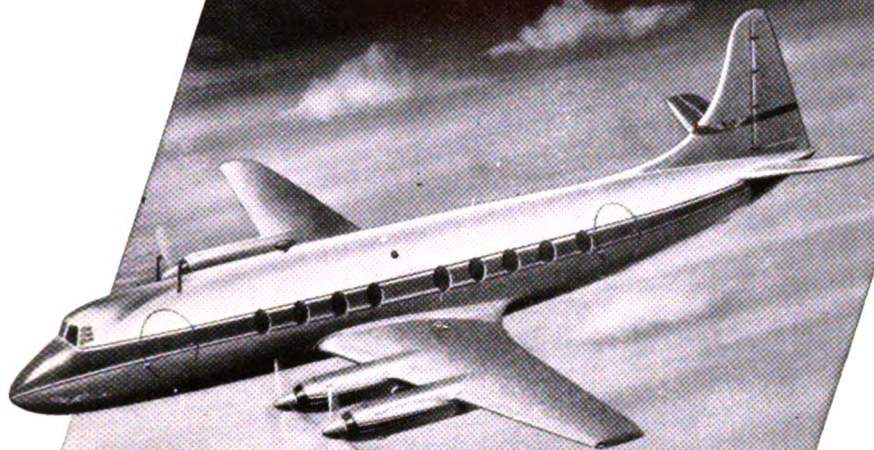
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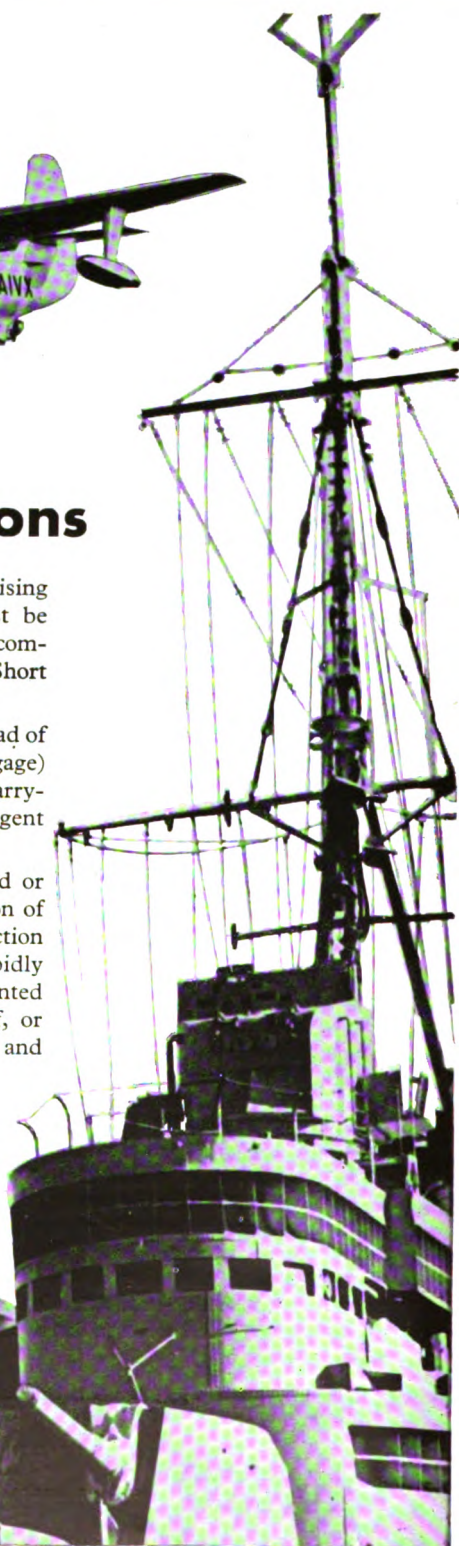
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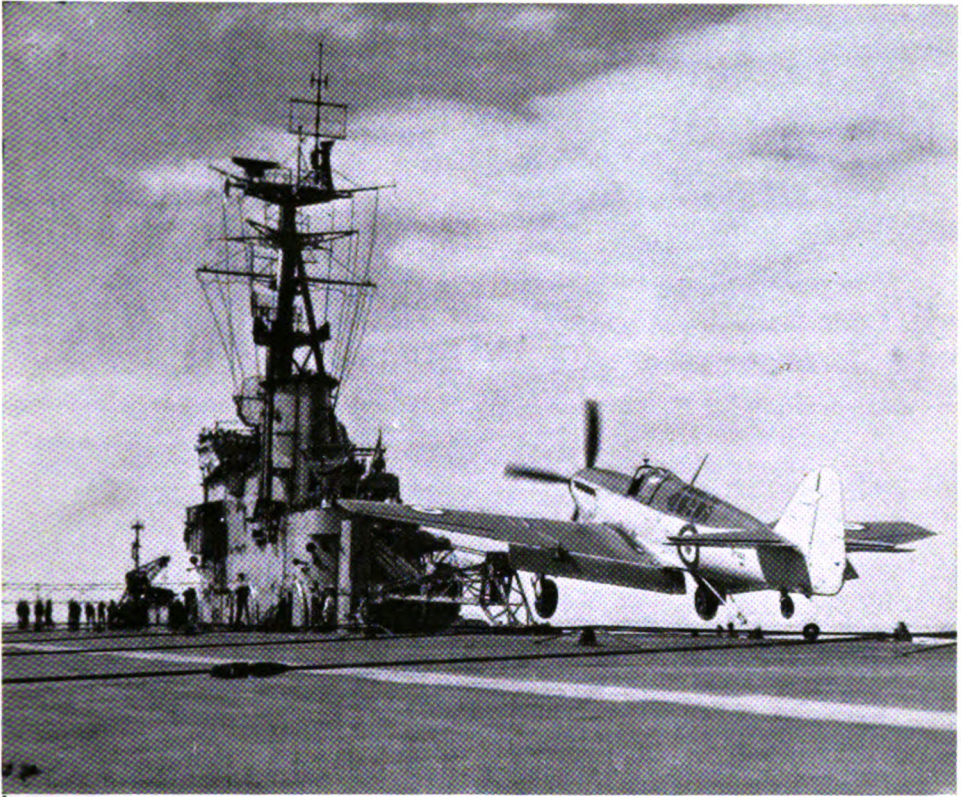
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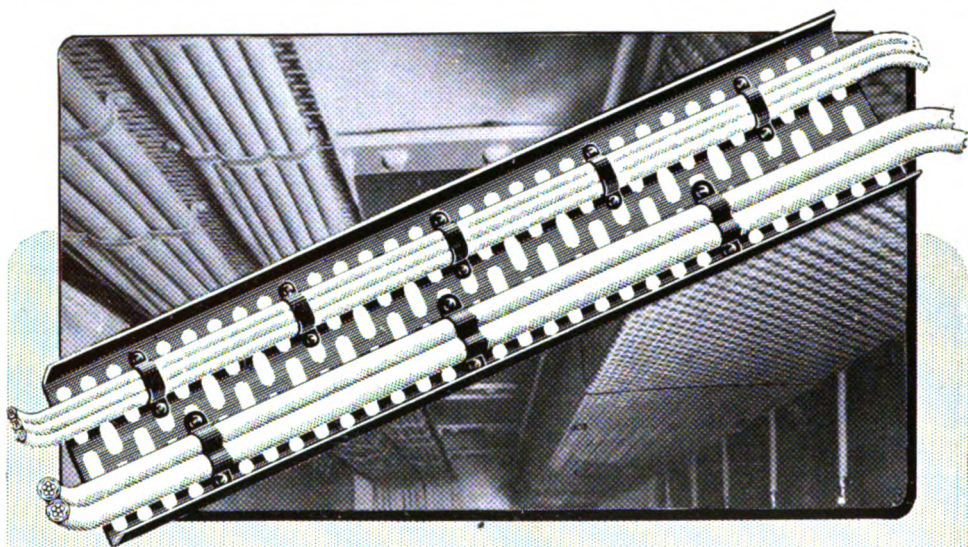
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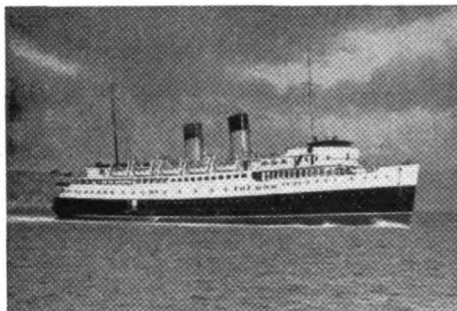
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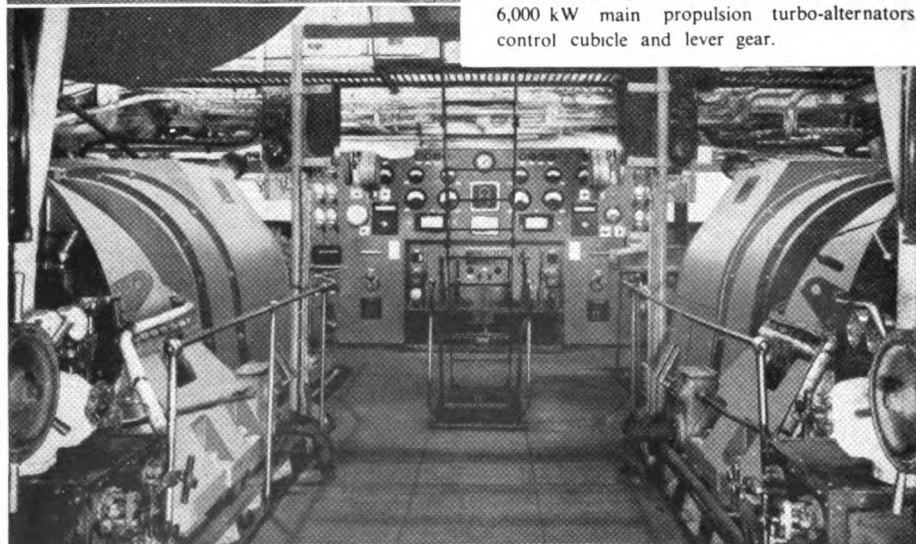
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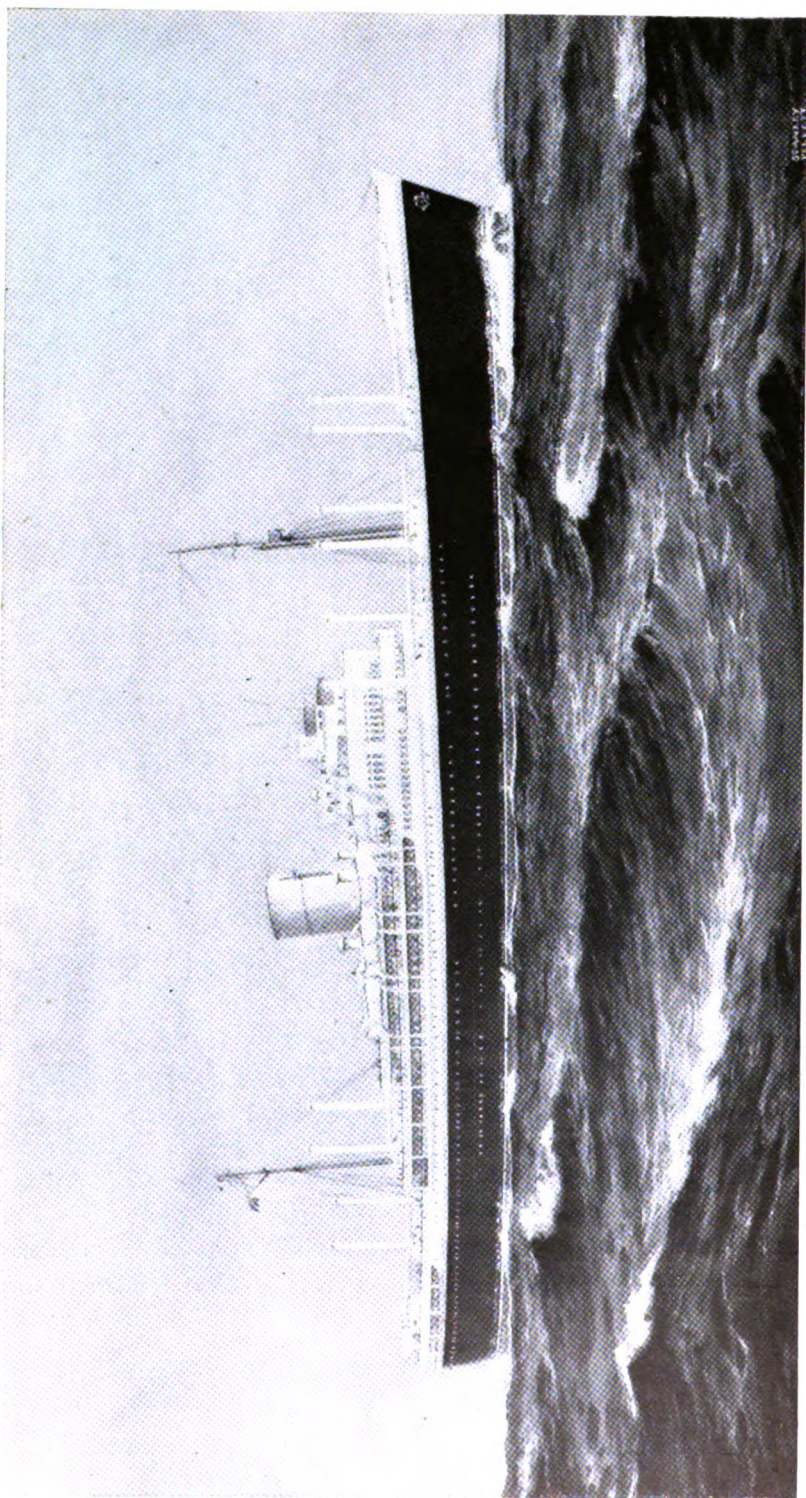
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BRASSEY'S NAVAL ANNUAL 1949

Edited by
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SIXTIETH YEAR OF PUBLICATION

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PREFACE

THIS year, "Brassey's Naval Annual" resumes the pattern customary up to 1948, though it is symbolic of the shrinkage in navies generally, compared with the great fleets chronicled before the first Great War, that it should be rather smaller in volume. Yet, though navies are smaller than they were, the influence of sea power on the conduct of war is as important as ever—a proposition which my own opening chapter is designed to demonstrate. It was written and actually in type before the appearance of Mr. Churchill's second volume lifted the veil from some of the inner history of the early operations of the late war; but the only result of that anticipation is, not that any modification is called for, but that it was not possible, as it would be now, to cite his great authority in support of the grounds on which it is based.

Difficulties of book production in the conditions of to-day again dictate a delay in publication until towards the latter part of the year. But advantage has been taken of that delay to bring the information contained rather more up to date, though it is chiefly the course of 1948 which is herein reviewed. Naval events of the year have been chronicled again by Captain Altham. The lamented death of Mr. F. E. McMurtrie, before he had completed his promised review of foreign navies, imposed on the editor the difficult task of finding a successor to him. I have been fortunate in securing the services of Lieutenant-Commander P. K. Kemp in that capacity, and am grateful to him both for stepping into the breach at short notice, and for the high standard of his review. Readers of past issues of "Brassey" will welcome another of the thoughtful and well-informed articles on the impact of the air arm on naval operations from the pen of "Volage"; and I hope that non-technical readers will appreciate the lucid exposition of the nature and details of the radar apparatus, which is perhaps one of the most notable examples of recent scientific progress as applied to the purposes of war, and of its profound influence upon both the strategic and tactical conduct of the operations of war at sea, from Lieutenant W. H. Kennett.

It is twelve years since the progress of naval engineering was reviewed in "Brassey." I print this year such a review from the practised pen of Commander (E.) A. Funge Smith, R.N., the author of a valuable handbook published in 1945 and entitled "An Introduction to Marine Engineering." Old readers of that valuable periodical, "Engineering," will be very familiar with the name of Commander Smith's father, whose mantle has evidently fallen on the son's shoulders. Finally, since the relations between the separate Services have been much discussed in Service and political circles of late, I have included a review of the defence structure recently adopted in the United States, which is of particular interest in this country inasmuch as it would appear to have been largely based on our own organisation, though going rather further in the direction of unification than we have yet found desirable in this country.

The Reference Section has once more been revised by the practised hand of Mr. R. J. Daniel, and it contains all the authentic information regarding

the details of the world's warships that had been made public up to the time of going to press. I would like once more to acknowledge with appreciation and thanks the courtesy and assistance of all those who have supplied the information and data for which they have been asked.

H. G. THURSFIELD

CHAPTER I

The Influence of Sea Power To-day

IT IS very remarkable that, so soon after the close of a war which illustrated very forcibly that sea power was as potent in 1939–1945 as in any former war in history, there should to-day be a tendency—fairly widespread, but confined to those who have made no close study of the art of war, its history or its practice—to assume that the influence of sea power, about which Mahan wrote, is now a thing of the past. Guided missiles, it is said, perhaps carrying atomic explosives, are now being developed to fly for hundreds if not thousands of miles; bombers are being built that can fly faster than sound and carry a bomb load across an ocean and return without refuelling. Such weapons were unheard of, even unthought of, when Mahan wrote; therefore, runs the argument, there can be no validity in his arguments and conclusions. Actually there could be no more dangerous misconception.

It would seem that the appearance of the atomic bomb has been largely responsible for the confusion of thought which gave rise to it. On the day that the Japanese Government made its submission to the terms dictated by the United Nations, a letter appeared in *The Times* from Sir William (now Lord) Beveridge in which he pronounced that “the atomic bomb has almost certainly relegated all other weapons of modern war—tanks, battleships, guns, rifles, and trained conscript masses—to the museum, to which they had relegated the long-bows of Agincourt and the sabres of Balaclava.” That was doubtless the impression produced on many minds at first thoughts by the horrifying effects of the two bombs dropped on Japanese cities in August 1945; yet second thoughts should reveal the fallacy on which it is based.

The fact is, as was pointed out by General Rowan-Robinson in a letter in *The Times* the day after that from Lord Beveridge and later in a book by Professor Blackett, that there are very few circumstances in war in which the atomic bomb can be used at all. Destruction of an enemy or of the country in which he lives has never been the aim even of an aggressor in declaring war. War aims, before that declaration at least, have commonly been either the annexation of desirable territory and the enslavement of its inhabitants or, on the other hand, resistance to such projects and the establishment of a rule of law, justice, and freedom. Those objects can only be attained by control on the spot, by occupation by armed force. Sir Walter Raleigh in his history of “The War in the Air” in the First World War expressed this fundamental truth in the words: “A country that is conquered must be controlled and administered; a city that surrenders must be occupied. Battles can be won in the air or on the sea, and the mark of victory is this, that the patient infantry, military and civil, can then advance, to organize peace.” There is no other way to victory.

In order to achieve it, however, it is necessary first to defeat an enemy's armed forces, which stand between the “patient infantry” and their goal, in order to deprive him of the means of resistance. In that process a

certain amount of destruction is unavoidable. But the belligerent who wreaks more than the absolute minimum necessary to bring him victory raises up for himself more difficulties than victory can solve, as the Allies have found in the course of their occupation of Germany in the last four years. What is needed to relegate all existing weapons to the scrapheap or museum is not a weapon of mass destruction, like the atomic bomb, but one which, if more powerful than they, must be far more local and controllable; it must be operative against an enemy's armed forces, of course, but, after the fashion of a battery controlled by "I.F.F." radar, against as little else as possible. It would then be capable, as it must be, of being used against those armed forces wherever they may be—a condition which the atomic bomb can never fulfill.

To demonstrate that proposition, it is only necessary to cite the situation in the late summer of 1940, when this country was faced with the imminent prospect—or so it appeared at the time—of invasion by German troops from across the Channel. If they had succeeded in crossing the Channel and making a landing, atomic bombs would have been of little if any use to us, unless we were prepared to blot out not only the invaders who had landed or were landing, but also all our own people, fighters and civilians alike, in the vicinity of the places where landings had been made. In the same way, their use against the French ports on which embarkation was believed to be in preparation or taking place would undoubtedly have blotted out great numbers of the French population living in the neighbourhood of those ports, but would have been effective against German concentrations only to the extent to which intelligence of their gathering was accurate. Both camouflage and dispersal, moreover, would have been employed to a far greater extent than it actually was, so that a number of bombs so used would certainly have been ineffective against the enemy; but they would have made it exceedingly difficult if not impossible for us to use the places bombed ourselves when, at length, we came to carry the war once again to the Continent. We even had an example of that untoward result in another theatre of war, though on a smaller scale, of course, since the atomic bomb was not then in existence.

When the Eighth Army was advancing into Tunisia up to the point at which the Axis armies were finally cornered and made prisoner, each coastal town behind their positions was bombed by British air forces in their attacks on the enemy's communications, and the towns themselves were in some cases practically razed to the ground before the enemy finally abandoned them in his retirement. The complaint was made at the time that that particular form of attack did not succeed in hampering the enemy very much. His armies continued to receive supplies largely by coastal craft from bases farther back, supplies which were not interrupted either in their passage up the coast or in their use of harbours near the front by the destruction of the towns adjoining those harbours. That same destruction, however, seriously hampered the British armies when they came to advance through them as the enemy eventually retreated. The destruction of the towns had its share, of course, in the defeat of the enemy who was occupying them, one by one, in the course of his retreat. How great that share was it is not easy to determine, but some authorities at least have estimated that it was but small. But two considerations present themselves with some insistence.

The first is that if the same effort and devoted service could have been concentrated directly on the enemy's supplies on the move, both sea-borne along the coast and—as was afterwards done in Normandy—by land behind his lines, it would have contributed directly to victory to a far greater extent than did the razing of towns, without repercussion afterwards on the advancing victorious army. The other is that, whether the razing of towns hit the enemy armies much or little, it inflicted the maximum of loss and suffering on the civilian inhabitants, to whose rescue, relief, rehabilitation, and sustenance the victors were compelled to devote, afterwards, substantial resources. It thereby added substantially to the victors' later difficulties and problems. Yet, the bomb being, comparatively speaking at least, a weapon of indiscriminate destruction rather than precision—on the authority of figures for accuracy given by Sir Arthur Harris in his book "Bomber Command" and later by the present Chief of the Air Staff in his Lees-Knowles Lectures at Cambridge—the temptation to use it in the mass destruction of towns rather than in the individual attack of small coastal craft or road convoys must have been great. It actually was so used. But it cannot be contested that what would have been far more valuable than the bomb in this case would have been a weapon of precision and methods of using it against precise targets; or, indeed, failing such a weapon being available, the concentration of those we did possess directly on the enemy armed forces and their supplies rather than on the easier operation of mere material destruction.

We may dismiss, therefore, Lord Beveridge's thesis that all existing weapons are obsolete. To do so is not to advance any theory that, if nations possess atomic bombs when they go to war with one another, they will not use them. Very possibly they will—though it is to be remembered that no belligerent in the late war used the weapon of poison gas, which all possessed, presumably from fear of retaliation in kind—but if they do, they are very likely to regret it bitterly later, when they realise that they have thereby raised up more problems than victory has solved; they will not win wars thereby. Peoples cannot be controlled by atomic bombs. If atomic bombs have been used against them, those who survive cannot even be supervised by those who bombed them, nor can their country be invaded or made use of. A war conducted by atomic bombs on either side could result in nothing but stalemate after an orgy of indiscriminate destruction which left both sides exhausted. There could be no peace or even survival except through occupation by men on the spot determined to prevent such folly at the source—just as the bombardment of London by "V" weapons in 1944-45 was brought to an end, and could alone be brought to an end, by just that method. We come back in the end to Sir Walter Raleigh's "patient infantry" once more.

That being so, it is clear that any war effort which does not conduce, as directly as may be, to the object of invasion and occupation of any enemy's country is wasted; so is any effort or method of warfare which, though perhaps contributing indirectly to that end, makes the work of control more difficult when occupation is at length achieved. This is true of any war, whether of aggression or of resistance to aggression; but it is with the latter that we are exclusively concerned in this country, so that it is unnecessary to extend this analysis to the former beyond pointing out that even Hitler recognised the truth that only occupation could achieve

victory. It remains to examine the importance of sea power in relation to these principles.

The object to which all war operations—of all arms—are to be directed being invasion and occupation of the enemy's country, the first step towards that end must be the assembly and equipment of the necessary force. For this country that has always involved drawing on the resources of the whole world; and, indeed, in world wars such as those of 1914 and 1939, the same must be true of any power that aspires to victory. It is clear that those resources can be assembled only by the means of sea transport. Aircraft, it is true, have been capable for a generation past of crossing oceans; nowadays they can cross an ocean in a few hours and to-morrow they will be able to do the double crossing, delivering an attack in the course of it, non-stop. But they cannot carry the weight of supplies needed by the armed forces of to-day, the equipment needed by modern armies on whom the ultimate decision alone can rest. They cannot even, except at enormous cost, carry the fuel needed by their own fighter consorts, whose escort is generally indispensable to themselves once they come within close range of an enemy, and in any case is indispensable to the armies in the invasion stage of a war. Sea transport and sea transport alone can carry the enormous weight and bulk involved, and sea transport cannot move except by virtue of sea power.

It has been suggested in some quarters that the "Berlin Air Lift" refutes this theory. Actually it merely confirms it. The supplies which are being flown into Berlin as these words are being written, great in quantity as they are, are minute in comparison with those which have to be moved in carrying on a war between great powers; and they are being moved, in the face of no hostile opposition, no greater distance than from the Western Zone of Germany into the city, little more than a hundred miles. The fact that that can be done is no guide to what can be flown across oceans in war conditions. And, moreover, the supplies that are being carried by air over the last short lap of their passage, so far as they are being derived from the rest of the world and not from the Western Zone of Germany itself, have been brought together entirely by sea. They have not been assembled by a process that dispenses with the use of sea transport. On the contrary, they could not have been assembled at all for that last air stage of their transport from source to destination without full use of the high seas—an advantage which, in time of war, can be conferred alone by sea power.

For what, after all, is sea power? According to the definition formulated by that great thinker and strategist the late Admiral Sir Herbert Richmond, following Mahan and many others who have brought reason and logic to their analysis of the problems of war—to the exclusion of enthusiasm, instinct, and prejudice, which in this sphere are but treacherous guides—it is that form of national strength which enables its possessor to send his troops and trade across the sea and to prevent his enemy from so doing. And since to carry his troops and trade—which we may take to include the supplies they need, as well as those of the country as a whole—he needs ships suited for that task, the possession of such ships, in sufficient numbers, is an indispensable element in sea power. That need, indeed, is even more fundamental than the need for armed strength; for it is useless to possess the armed strength capable of protecting sea traffic

if there is none of that traffic, owing to the lack of ships to carry it, to protect; and it is equally useless merely to sweep an enemy's traffic from the seas if, needing resources from all over the world to enable armies and air forces to continue operating, one lacks the means of bringing them in. The supreme importance of ships of burden to the sea power of the Allies in the late war was well understood by the Germans when they concentrated their efforts at sea against them, in the U-boat campaign that became known as the Battle of the Atlantic.

It is as well to emphasise this point of the importance of the ship of burden, because there is a tendency to assume that sea power is an affair of navies alone, and thence to pass to the proposition that it has been superseded by "air power," that air forces have taken or should take the place of navies in the armed forces of to-day. Air forces, indeed, have already taken a large share in the duties of navies in their task of exercising sea power, and their share is likely to grow larger and larger yet. But even if they did come to the point of superseding warships—and they are a long way off that yet—that would not mean that "air power had replaced sea power." Starting from the definition I have quoted and looking at the capabilities of air transport to-day, none can escape the conclusion that the one object of all fighting at sea, whether by warships or by aircraft, is to keep the humble ships of burden moving, by defeating all attempts by the enemy to interrupt them. That is the great difference between battles on land and battles at sea. The one can bring final victory as being part of the process of occupation of the decisive area of the world; the other can not do more than prepare the way for the winning of that victory; but it is the only thing that can prepare the way.

Sea power is thus indispensable to the initial stage of assembling and equipping the force that alone can effect final victory. It is obviously just as essential to the next stage, of conducting the military campaign which is to carry the "patient infantry" to their goal. The task of the naval and air forces which mastered the U-boat campaign in the Battle of the Atlantic by the end of 1943 was not completed when the great Anglo-American armies, with their contingents from the lesser Allies, were assembled in Britain for the beginning of the final assault or had fought their way laboriously along the whole length of Italy. Sea power alone could keep them supplied, with fuel, munitions and reinforcements, from all over the world, but chiefly from North America. The great Anglo-American Air Forces would quickly have been grounded if there had been any serious interruption of the steady flow of fuel from America and Persia, as the enemy knew very well when he concentrated his attacks on tankers in the Atlantic. Any diversion of the forces engaged in maintaining the command of the sea to any less primary and fundamental strategic task would quickly have had a hampering effect on the main assault, and might even have brought it to a standstill. Once the Allied armies got to grips with the enemy at a later stage, too, they must have been halted without a never-ending stream of sea-borne supplies; and these conditions persisted right up to the very moment of the German collapse and surrender.

There is, moreover, another stage in any great war in which sea power is an essential factor. Sea power is not concerned alone with the movement of supplies. By definition, it makes possible the movement of armies,

and indeed the belligerent who is separated by sea from his enemy must of necessity go through an amphibious phase in his progress towards victory. It is then the duty of sea forces—a duty shared, of course, by air forces—to ensure the sanctity and continuity of the sea passage, to prevent any interruption of it by enemy forces, and to take their full share of amphibious fighting. At that period, too, besides performing their normal functions in their own elements, it falls to them to take over the functions of those army weapons which are not for the time being available. Ships' guns must take the place of land artillery until such time as it is deployed, and indeed must continue to supplement its power so long as the land fighting is going on within their range. That is an essential part of the operation of sending armies across the sea, but not the whole of it.

The amphibious phase calls for the development and production of specialised ships of burden—"landing ships" and the landing craft which were built in such large numbers, and to such variegated designs, during the later stages of the late war. That they too were an essential element in sea power has come to be recognised only gradually. In the Gallipoli campaign in 1915 and again in the Norway campaign in 1940 the full effect of sea power could not be exerted because that essential element was lacking—that, of course, was not the only cause of the failure of those two campaigns, but it was an important one, and in itself would probably have proved decisive even if there had been no other operating. The organisation and operation of these specialised ships and craft is a naval duty. Armies have enough to learn and practise in the highly specialised art of fighting on land, and it would be a waste of energy and resources to require them to become partly sailors for the very small interlude in their active campaign that they will spend afloat.

Moreover, as pointed out earlier, the need to secure the sea passage does not end when the van of an army has crossed the sea and established itself in enemy-held country, or even when the fighting zone has moved inland out of range of ships' guns. That phase was reached in little more than two months after the Normandy landing in 1944, but there was yet another nine months of fighting to come before the victory was won; and during that three-quarters of a year the need for sea-borne supplies became ever greater and greater. Also during those nine months, though there was some easing of the strain of combating the U-boats once they were deprived of their bases on the French Atlantic coast, yet that was to a substantial extent cancelled out by the technical improvements in the U-boats which were then first beginning to make their effect felt. At the end of the war the Anglo-American naval authorities, reporting that they had finished the job, also reported that though they had held the upper hand over the U-boats firmly for the last two years, they had done only by unrelenting vigilance and the unceasing devotion of those who had been fighting the battle; and that, had not the German collapse come when it did, in order still to keep the upper hand they would have had a whole host of fresh problems to solve arising out of those same new technical developments in the U-boats which the enemy was just near the point of bringing fully into action. Not only was command of the sea just as indispensable right up to the actual achievement of the full and final victory as it had been in the earlier phases of the war, but the tasks of gaining and maintaining it remained as arduous as ever, without

relief, to the end. It was never possible to relax either effort or resources devoted to those tasks, or to say, before the full collapse and surrender of the enemy, that the task of sea power was done.

The story of the war in the Pacific against Japan leads to the same conclusion even more unmistakably. Japan, the enemy, could only be reached by sea. The great forces which, under General MacArthur, finally liberated the Philippines, could not have been built up to strength in Australia without full and free use of the sea between that continent and America. The forces which, under Admiral Nimitz, crossed the central Pacific, seizing the Marshall Islands, the Marianas, the Bonin Islands, and finally the Riukiu Islands on the way to Japan itself, had to win and maintain command of the sea for every step of their progress. The northern forces which liberated the Aleutian Islands to open that route to Japan were under the same impelling necessity. Before ever the two atomic bombs were dropped on Japanese cities, Japan had begun to sue for peace, crippled to point of helplessness by the loss of her own sea power. In August 1945 Japan's air forces were larger than they had ever been before; but fuel supplies could no longer reach her, cut off by the Allied destruction of her navy and the immense toll they had taken of her ships of burden. The amphibious phase was never reached in Japan itself, because the Japanese recognised their defeat and admitted the "patient infantry" in the end without resistance; and it was sea power alone that put them there.

The controversy will probably never be settled between those who believe that the atomic bombs brought victory and those who hold that the victory was already so far won before the only two then existing were dropped respectively on Hiroshima and Nagasaki, that they were, in effect unnecessary. But even they could not have been used as they were but for the command of the sea, already won and maintained, before they were even produced. Moreover, it may be remarked that, even if there had then been in existence, as there are to-day, aircraft which could have taken off from America to drop them on Japan; and if they, in such circumstances, had induced Japan to surrender—a highly disputable proposition—there would still have remained the necessity to transport the "patient infantry" to make the victory secure, which brings us back to the inescapable necessity for sea power.

The misconception mentioned in the first paragraph of this chapter thus becomes apparent—it arises from a misunderstanding of the very nature of sea power, from the assumption that it means great fleets, especially of battleships, and nothing else. Once it is realised that the chief object of sea power is to keep the ship of burden moving and to ensure her against interruption by anything the enemy may do—and at the same time to deny the seas to the ships, whether of war or of burden, of the enemy—the controversy as to the instruments by which those objects are to be maintained falls into its true position of unimportance. So does the frequently expressed, but actually unreal distinction between "offensive" and "defensive" as applied to particular weapons or particular operations. For instance, except for the actual amphibious assault stage, which, as shown above, must find a place in any campaign between two Powers whose territories are separated by sea, the role of sea forces—by which expression is meant the forces, floating or flying, allocated for the

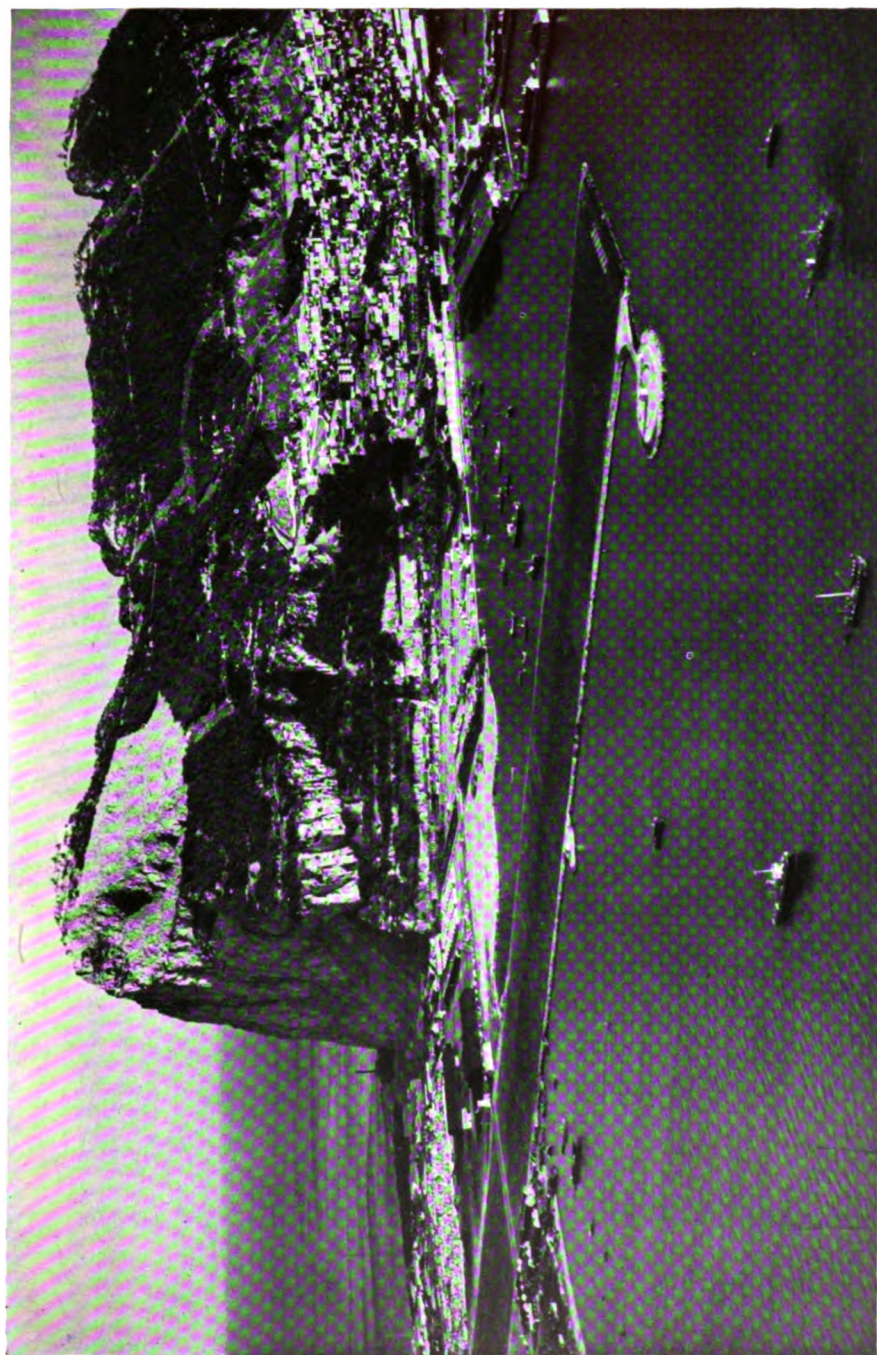
moment to operations on, above, or below the sea—may be said to be defensive, in that it is wholly directed to protecting the ships of burden from interruption. But the only certain method of preventing interference with sea-borne traffic is to destroy those enemy forces which can or do try to interrupt it—a course of action which cannot be described otherwise than as offensive in principle and practice.

That, therefore, is the true role of sea forces—first and foremost to seek out, attack, and destroy enemy forces operating at sea. It is an illuminating illustration of the fundamental principle that the objective of armed forces in war must be the armed forces of the enemy. There is no substitute for that necessity, no way of avoiding its compulsion, of winning wars while avoiding battles. Wars are made by armed forces; only by eliminating or neutralising those armed forces can victory be won. Yet it is surprising how often that fundamental truth has been either ignored or denied. Time and again the appearance of a new weapon has induced some enthusiasts to declaim that it will bring victory of itself, rendering all earlier weapons obsolete; that it provides a short cut to victory; in short, that it eliminates the need for battle. The claim has never been borne out in practice.

Before passing on to consider weapons and methods, it may be remarked that, if they are adequate to achieve the first element of which sea power by definition consists, they are clearly adequate at the same time to achieve the second. If the seas and skies can be swept clear of enemy forces that might interfere with the free use of the sea by the navy of burden, there can be no difficulty in sweeping them also clear of enemy traffic. The power to use the sea as a highway for troops and trade, as well as the power to deny that use to the troops and trade of an enemy, follow automatically on victory in the sea battle; and until that victory is won, they cannot be ensured.

Turning to the instruments of sea power, it is clear that, their first duty being the destruction of the enemy forces that may threaten use of the sea, their nature must depend upon that of those of which the enemy disposes. The latter will certainly, in any war that can be foreseen to-day, comprise ships, aircraft, and submarines; and the force needed to counter their attacks will comprise all weapons or instruments that are effective against any or all of those enemies. Against enemy ships—whether warships or disguised marauders such as those used so extensively by the Germans—warships, submarines, and aircraft are all effective. Against enemy aircraft the chief weapons are also aircraft, but gunfire from ships is also highly effective; and as the aircraft needed to counter air attack on ships are of the short-range fighter type, they will need, except in narrow waters, to be operated from aircraft carriers. Against enemy submarines a combination of ships and aircraft proved highly efficient in the late war.

If there is one conclusion that emerges from the experience of the late war more unmistakably than any other, it is that no one arm is fully effective by itself, and that in the collaboration between arms lies the secret of victory. The most striking example, perhaps, was the war against the U-boats. Convoy escorts of surface ships, if acting by themselves, needed to be numerically so strong as to be beyond resources if complete protection was to be given. Reinforced by aircraft, each arm



British naval bases—Gibraltar, showing run-way at North Front
“Planet” Photograph



U.S. amphibious manoeuvres in the Caribbean. An L.S.T. unloading

U.S. Official Navy Photograph

supplemented the deficiencies of the other. The aircraft could both locate the enemy far enough from his quarry to attack him first, and so foil the attack he intended; but once the submarine dived, the aircraft was helpless for further action. The escort craft, however, guided to the vicinity of the U-boat by the aircraft that had sighted and attacked, could continue the attack on the enemy submerged and stick to him until destruction was achieved. By the provision of adequate forces of each arm and by their close and cordial collaboration in operations was the U-boat mastered.

The same conclusion emerged from every phase of the late war. When collaboration between arms was full and cordial and when each available in adequate proportion and strength, victory followed. When one arm was lacking or co-operation between them was inadequate, failure or even disaster was the result. Especially was this the case with sea power. Command of the Mediterranean, for instance, lost in the days of weakness, especially of the air arm, that followed 1940, was regained in 1943 after sea, land, and air arms all worked together to conquer North Africa and thereby to re-establish it. Command of the Atlantic was all but lost in 1940-42, when sea forces were left almost unsupported and inadequate in their own strength to struggle for it. Not until 1943, when deficiencies in the air arm—so sorely needed earlier, when vast resources were being devoted to the bombing of U-boats under construction in building yards, which could only at the soonest come into action a year later—were made good, was it regained; and even then, land forces, occupying the Faroes, Iceland, and the Azores, were called on for their contribution before it was complete.

The visionary enthusiasms of specialists have their own immense value in ensuring that progress shall not be stifled; but they should not be allowed—as they sometimes have been allowed in the past—to obscure recognition of the plain and simple lessons of experience. Perhaps common sense is the most valuable gift for those called on to direct their country's efforts in a struggle for existence. First things must be put first and not neglected in favour of new things which may become realities one day but which are still in the lap of the future. That is the lesson of the last as of all great wars of the past; may it be recognised and not forgotten in the future, if it should be our ill fortune to be engaged in another.

H. G. THURSFIELD

CHAPTER II

The Naval Year

SOME "alarm and despondency" followed when the effects of the Government's policy of accelerating the post-war run-down of the Navy, in conjunction with the other Services, began to be realised. On October 23, 1947, the Minister of Defence, Mr. Alexander, made a statement in the House of Commons in which he said that the strength of the Navy at March 31, 1948, would be only 147,000 instead of the 178,000 previously planned. He asserted that it was after deliberate consideration of the relative advantages and disadvantages of making the reductions quickly at the expense of temporary dislocation that the Admiralty advised, and the Government approved, that the reductions should take place by that date. This had the appearance of an attempt to make the Admiralty appear responsible for a state of affairs which was brought about by the Government's, and not the Admiralty's, policy.

Under this policy the Admiralty had very difficult problems of organisation and administration to solve. It meant that large numbers of men would leave the Service earlier than they expected; in fact, no less than 45,000 had to be passed through the demobilisation depots before the end of March—a rate of release double that previously planned. Even so, it was not possible to let all categories of ratings go equally quickly. If welfare and administrative services were not to be disorganised, certain classes, such as Sick Berth Attendants, Stores and Writer ratings and Naval Aviation ratings, could not have their releases accelerated to the same extent as the remainder. Again, if the strength of our naval forces abroad was not to be reduced to an extent which might well have a serious effect on British prestige throughout the world, and if there was to be fairness in releasing men abroad *pari passu* with those at home, it was necessary, according to the Minister of Defence, to draw trained men from the Home Fleet and other home stations to relieve men on foreign service.

It was estimated that the 147,000 left in the Navy would be composed of approximately 114,000 Regular and 22,000 National Service men; the remainder being W.R.N.S. or "locally enlisted personnel."

When the Navy Estimates for 1948-49* were issued on February 24, 1948, an Explanatory Statement by the First Lord (Cmd. 7337)† followed on the 27th, and gave some details of the numbers provided under Vote A. The total of 167,300 included 20,000 on release leave. On the latter being discharged, the reduction decided on would have been approximately completed. The total also included 8,000 W.R.N.S.

The most serious difficulty the Admiralty had to contend with was training. The rapid run-down of the Navy meant the loss of a very high proportion of trained and experienced ratings, with the result that there was a serious dearth of qualified men to man the ships and of instructors to teach the new entries. In the present day, ships' companies can no

* See "Brassey," 1948, p. 506.

† *Loc. cit.*, p. 508.

longer be made up by the simple process of drafting so many men from barracks regardless of specialist qualifications, and the effect of the Government's policy was to starve the fleet of trained men until the schools and establishments could, with great difficulty, make good the deficiency. It was really a choice of evils—to keep ships in full commission but not properly manned, and thereby to delay training, or to reduce the number of ships in commission and so be able to concentrate on training ashore. The Admiralty choose the latter course as making for the earlier recovery of efficiency.

As showing the effect of this policy on the proportion of naval officers and men employed afloat and ashore, a statement made by the Parliamentary Secretary gave the following figures on March 1:

		<i>Ships in full commission</i>	<i>Sea-going ships employed on training duties</i>	<i>Ships in reserve or reducing to reserve</i>
Officers	..	3,700	900	1,500
Ratings	..	32,300	7,400	13,500
<i>Borne in Shore Establishments</i>				
Officers	..	..	..	..
Ratings	..	..	..	..
				8,500
				77,500

No doubt it was the defect of a political mentality, but it was bad psychology which produced the attitude of official secrecy about the effect of the loss of manpower on the strength of the sea-going fleet; at home it caused suspicion and anxiety, yet the foreign intelligence services could have had no difficulty in getting at the facts. Eventually the Minister of Defence was compelled to drop this ostrich-like policy because the Navy League published the table reproduced in last year's "Annual," and the Statement on the Navy Estimates for 1948-49 gave in some detail the operational strength of the fleet. This was as follows:

Battleships.—Duke of York and Vanguard (to be operational by August/September, 1948).

Fleet Carriers.—Nil.

Light Fleet Carriers.—Ocean, Triumph, and Theseus (to be operational by June/July 1948), and Glory (date uncertain).

Escort Carriers.—Nil.

Cruisers.—16, including one (Liverpool) to be operational by April 1948, four (Sirius, Diadem, Cleopatra, and Belfast) by autumn 1948, and one (Jamaica) by the end of 1948. One (Superb) to be immobilised in August 1948.

Destroyers.—34, including five to be operational by June 1948, eight by August/September 1948, and three uncertain.

Frigates.—25.

Monitors.—Nil.

Submarines.—26.

Minesweepers.—12.

Fast Minelayers.—Nil.

Other units of the Fleet were shown as "Training and Experimental" or "In Reserve or Reduced to Reserve." This statement represented the best face the Admiralty could put on what amounted, for the time being, to little less than the wrecking of the Navy, and the paucity of ships really ready for service during the first seven months of the year was obvious. The Parliamentary Secretary, Mr. Dugdale, in presenting the

Estimates in the House of Commons on March 8, made play with the assertion that "the Mediterranean Fleet has remained virtually at full strength," and the forecast that a resuscitated Home Fleet would do a cruise to the West Indies in the autumn. He was discreetly silent about the existing condition of the Fleet in the Far East and on other stations; but events spoke for themselves. When the time came for the spring cruise of the Home Fleet it could muster no more than a single cruiser—H.M.S. *Superb*—and four "Battle" class destroyers. The trouble in British Honduras and challenge by certain South American Powers to our rights to the Falkland Islands and Antarctic dependencies brought out the fact that to protect our interests on the whole long Atlantic coast of the Americas we had only one cruiser, H.M.S. *Sheffield*, one sloop and one frigate; it was merely fortuitous that H.M.S. *Devonshire* was doing a training cruise in the West Indies at this time and was able to make an opportune appearance off Belize in company with the *Sheffield*. On February 27, the C.-in-C. of the British Pacific Fleet mentioned in an interview that the "rebuilding" of that Fleet would begin in June with the return of some destroyers, and that aircraft carriers would return towards the end of the year: a clear admission that in the Far East the most important units of a modern fleet—aircraft carriers—were conspicuous by their absence.

This parlous condition of the British Navy did not escape notice abroad, and the governments of Argentine, Chile, and Guatemala seized the opportunity to make political capital by "twisting the lion's tail." Argentine and Chilean warships entered Antarctic waters and landed parties on British territory, asserting their "indisputable rights" in the "South American Antarctic." The Argentine government also claimed that the Falkland Islands were considered Argentine national territory by right. Not to be outdone, Guatemala started an acrimonious exchange of Notes with the British Government about British Honduras, which they claimed to be "... part of the national territory retained by a powerful empire"; inflammatory articles appeared in the Guatemalan press and there was reason to believe that extremist elements might attempt to invade this old British Colony. Fortunately, the Navy was equal to the occasion, and while the cruiser *Nigeria*, from the South African Station, dealt with the situation in the South Atlantic, the C.-in-C. West Indies with the two cruisers available and a force of Royal Marines and detachment of the Gloucestershire Regiment arrived to restore prestige and morale in Belize.

As compared with the more formidable threats to peace from other parts of the world, these incidents may seem to be of minor importance, but they provided a clear warning of what may happen to British interests if we do not maintain an adequate Navy to police them; they also serve to remind us that however important air power has become in war, sea power as represented by a surface navy is as indispensable as ever in peace. It is impossible to avoid the conclusion that in crippling the sea-going Fleet as they did, the Government ran a very grave risk.

The Board of Admiralty announced on November 7, 1947, that they did not contemplate having to resort to "axing" measures to reduce the number of officers in the Navy. Reductions were being obtained by speeding up the release of temporary officers. This was reassuring, in

that it meant that the clumsy and inefficient system of clearing the officers' lists adopted after the 1914-18 war would not be repeated, but the drastic reduction of ships to be kept in commission, even after the run-down already referred to, meant that the number of senior officers required for the post-war Fleet would inevitably be less. This could not fail to cause great hardship to many officers who had hoped that the Navy would be a life-time career and who had reached an age when domestic responsibilities were in many cases at their zenith. Although "axing" was theoretically avoided the fact remained that during the three years ending in 1948, thirty-nine Captains were retired as compared with thirty-four promoted to Flag rank.

BOARD OF ADMIRALTY

It was announced on February 14 that the King had approved the appointment of Admiral Lord Fraser of North Cape as First Sea Lord and Chief of Naval Staff, in succession to Admiral of the Fleet Sir John H. D. Cunningham, to take effect the following August.

Sir John Cunningham had held that office since June, 1946, and had expressed a wish that it should not be prolonged beyond the date announced.

Lord Fraser had been Commander-in-Chief, Portsmouth, since May, 1947. He was promoted to Admiral of the Fleet on October 22, 1948.

In March Vice-Admiral Sir Cecil Harcourt replaced Admiral Sir Arthur Power as Second Sea Lord and Chief of Naval Personnel.

Other changes among the Sea Lords during 1948 were the appointment of Rear-Admiral H. A. Packer as Fourth Sea Lord and Chief of Supplies and Transport, in succession to Vice-Admiral Sir Douglas B. Fisher, on March 29; and of Vice-Admiral G. E. Creasy as Fifth Sea Lord and Deputy Chief of Naval Staff (Air) in succession to Vice-Admiral Sir Philip L. Vian, which took effect in April. Rear-Admiral R. A. B. Edwards succeeded Rear-Admiral G. N. Oliver in August as Assistant Chief of Naval Staff.

It was announced in Parliament on June 30, that a considerable part of the Admiralty headquarters organisation was to be permanently located in Bath. Broadly speaking, that part would comprise those departments concerned with construction, maintenance, and supply of the Fleet and its establishments, and with contracts and accounts. This decision was made, doubtless, in order to put on a peace-time footing the organisation which became necessary during the late war due to expansion of the Admiralty and lack of accommodation in London; also to be in line with the policy of dispersing administrative centres which would be particularly important in time of war.

The Naval Secretary to the First Lord changed on April 12, when Rear-Admiral P. B. R. W. William-Powlett relieved Rear-Admiral M. J. Mansergh in that appointment.

PRINCIPAL COMMANDS

Changes took place in two out of the three principal Home Port Commands and in five sea-going Cs.-in-C. Commands during 1948. Admiral Sir Algernon Willis took over the Portsmouth Command from Admiral Lord Fraser of North Cape in July. Admiral Sir Henry R. Moore

succeeded Admiral Sir Harold M. Burrough at the Nore in November. On January 7, Admiral Sir Neville Syfret hauled down his flag in H.M.S. Duke of York on being relieved as C.-in-C. Home Fleet by Vice-Admiral Sir Rhoderick McGrigor. On May 13, Admiral Sir Algernon Willis left Malta, when Admiral Sir Arthur Power succeeded him as C.-in-C. Mediterranean Station. Admiral Sir Denis W. Boyd was relieved in December by Vice-Admiral Sir E. J. Patrick Brind as C.-in-C. British Pacific Fleet. Admiral Sir Arthur F. E. Palliser handed over command of the East Indies Station to Vice-Admiral C. H. L. Woodhouse on February 20. The South African Station changed hands in May, when Vice-Admiral Sir Clement Moody was relieved by Rear-Admiral E. D. B. McCarthy.

Other important sea-going Flag Appointments during the year were Vice-Admiral Sir Thomas Troubridge to be Flag Officer (Air) and Second-in-Command Mediterranean in January; Rear-Admiral M. J. Mansergh to command Third Aircraft Carrier Squadron in July; Rear-Admiral the Earl Mountbatten of Burma to the First Cruiser Squadron in October; Rear-Admiral the Hon. Guy H. E. Russell to the Second Cruiser Squadron in January; and Rear-Admiral A. C. G. Madden to the Fifth Cruiser Squadron in September.

Acting on medical advice, Vice-Admiral Sir Thomas Troubridge struck his flag on November 6, and returned to the United Kingdom. He was succeeded in the following month by Vice-Admiral C. E. Douglas-Pennant.

Ashore, Admiral Sir Frederick H. G. Dalrymple-Hamilton joined the British Joint Service Mission in Washington; Vice-Admiral E. R. Archer became Flag Officer Commanding Scotland and Northern Ireland; Rear-Admiral G. Grantham, Flag Officer (Submarines); and Rear-Admiral G. N. Oliver, President of the Royal Naval College, Greenwich.

THE WESTERN UNION

Under the Treaty signed at Brussels in March, 1948, the Western Union Powers set up a defence organisation which provides for "the co-ordination of defence measures in the military and supply fields, and for the study of the tactical problems of the defence of Western Europe. In addition the defence organisation provides the framework on which, in the event of an emergency, a command organisation could be built up."

A Western Europe Commanders-in-Chief Committee was established under the chairmanship of Field-Marshal Viscount Montgomery of Alamein. Général d'Armée de Lattre de Tassigny was nominated as C.-in-C. Land Forces Western Europe; Air Chief Marshal Sir James Robb as C.-in-C. Air Forces Western Europe; and Vice-Admiral Jaujard as Naval Representative with the title of Flag Officer Western Europe. The main task of this body was to study the tactical problems of the defence of Western Europe. It would not assume executive command of any Forces in peace-time.

It will be noted that the naval side of the organisation in no way encroaches on the Admiralty's responsibility for the control of the British Navy in time of war, although it should greatly assist to co-ordinate planning on a high plane and the co-operation of the fighting forces of all the nations concerned in the event of hostilities. No overall naval command is provided for.

ORGANISATION AND ADMINISTRATION

It was announced by the Admiralty on June 9, that in order to facilitate inter-Service co-operation in the Far East it had been decided that the shore headquarters and H.Q. staff of the C.-in-C., British Pacific Fleet, should be moved from Hongkong to Singapore. When not on cruises or carrying out fleet operations, the C.-in-C. would reside at Singapore, where he would be in close contact with the Army and R.A.F. Cs.-in-C. Hongkong would remain the operational and training base of the Fleet in the Far East. The title of the C.-in-C. would be changed to "Commander-in-Chief, Far East Station." The Flag Officer Commanding Fifth Cruiser Squadron would deputise for the C.-in-C. at sea when the latter was at his shore headquarters in Singapore.

Following on this decision, Admiral Sir Denis Boyd transferred his headquarters from Hongkong to Singapore on September 15. Rear-Admiral Madden then became Flag Officer Commanding Fifth Cruiser Squadron and Flag Officer Second-in-Command, Far East Station.

ENTRY AND TRAINING OF OFFICERS

It was announced in Parliament on January 28, that changes were to be made in the system of entry of Cadets into the R.N. College, Dartmouth. The new system of entry and its examination, it was stated, were designed "to ensure that no boy was prevented from competing by reason of his social status, school, or financial standing." The system would apply to the Executive, Engineering, and Supply branches. There would be three entries of Cadets in each year, and the new age at entry would be 16 to 16 years 4 months. The interview part of the examination would be extended in its scope. The first new entry would be in September 1948.

As a result, Cadets will now spend six terms at the R.N. College, Dartmouth, followed by a period of eight months' training in a training cruiser, before they go to the Fleet as Midshipmen. Tuition and maintenance are free. The Admiralty provide uniform and replacements during the Cadet period; but parents are expected to pay for the cost of uniform and Cadets' personal expenses, according to their means; some will not be required to pay anything.

There are now five other sources of entry for the Navy's Commissioned officers:

Special Entry to Executive, Engineering, and Supply Branches.—age 17 and 4 months to 18 and 4 months. They go to Dartmouth for one term and then to the training cruiser.

Special Entry Electrical Branch.—Age between 17 and 19. They qualify by the Higher School Certificate. Entry is entirely decided by the interview. They join up with the other Special Entry Cadets.

Direct Entry for Executive and Engineering Branches.—Age 17 and 4 months to 18 and 4 months. They come from the Merchant Navy training establishments, Pangbourne, Worcester, and Conway.

Upper Yardmen.—This is the principal entry from the lower deck, and is at present confined to Executive, Air, and Electrical branches. They are accepted up to 23½; some branches up to 28. They pass a

preliminary Fleet Board before going to the training establishment, H.M.S. Hawke; after a month under training and observation, they go before an Admiralty Selection Board.

Warrant Officers direct promotion to Lieutenant.—Age 25 to 36. They are selected by the Admiralty on their Commanding Officers' reports, and do 34 weeks' technical courses during which time they are finally selected for promotion.

The Admiralty policy is to obtain 20 to 25 per cent. of all officers from the lower deck. This scheme and the Upper Yardmen scheme are designed to provide most of this quota.

Cadets (E) and (L).—This is a small entry of specially picked Boy Artificers. They do one term at Dartmouth and then specialise in their engineer and electrical branches.

It will be noted that all the above entries, except the Upper Yardmen and Warrant Officer direct promotions, meet in the training cruiser. Here they get experience of the conditions under which men on the lower deck live and of the general running of a sea-going ship. They complete their theoretical instruction in navigation, engineering, naval electrics and ship construction up to the rank of Sub-Lieutenant; they get practical instruction in seamanship, navigation, and engineering, and elementary instruction in gunnery, torpedo, anti-submarine work, and communications.

The Executive and Supply Branches then go to sea as Midshipmen. The Engineers go to the Royal Naval Engineering College, Devonport.

After their Midshipmen's time the Executive and Supply Branches meet again at Greenwich, where the R.N. College provides a general education course run on University lines with no examinations.

After another spell at sea as Acting Sub-Lieutenants, the Executive Branch do their technical courses to make them fully trained Sub-Lieutenants and, in due course Lieutenants. Air specialists break away as Sub-Lieutenants, after getting their Watch-Keeping certificates, to do 18 months' air training. Submarine specialists break away after the technical courses to do 18 weeks' Submarine course.

Higher training is now provided for the Executive Branch by some or all of the following courses: The Tactical Course; R.N. Staff Course; Joint Services Staff Course; Senior Officers Technical Course; Senior Officers War Course; Imperial Defence College.

Officers of the Electrical, Engineering, and Supply Branches undergo training which is designed to fit them for their special duties. A small number attend the R.N. Staff Course.

As part of naval post-war economy, certain training establishments were closed. These included the stoker-mechanic training establishment (H.M.S. Imperieuse), the Sea Mining School (H.M.S. Lochinvar) at Port Edgar, the naval communications training centre at Lowton St. Mary, and the training establishment at Gosport (H.M.S. St. George).

RECRUITING

An addition to the recruiting programme was made in October, when entry was opened to youths between the ages of 16½ and 17½. Formerly recruits had to be between 15 and 16 (boys) or between 17½ and 23 (men).

At first, the numbers to be entered under the new scheme will be limited to 1,000. Youths can enter in the new rates of junior stoker, junior writer, junior stores assistant, junior assistant steward, junior assistant cook, and junior naval airman. In addition, there is a scheme for entering junior electricians' mates and junior radio electricians' mates at 16½ years. Ratings will be entered on special service engagements for about eight years' service with the Fleet and four in the Royal Fleet Reserve.

The Admiralty have decided that all National Service men in the Navy shall have an opportunity to reach officer rank during their period of full-time service. Successful candidates will be required to join the R.N.V.R.

THE WOMEN'S ROYAL NAVAL SERVICE

The W.R.N.S. has been established as a permanent part of the peace-time Navy, and permanent pay scales have been approved for both officers and ratings.

On December 11 the Admiralty invited applications from suitable women for special entry to officer rank. Candidates have to be between 20½ and 29 years of age, of good general education, and desirous of making the Service a career. Special opportunities were open to applicants with good qualifications in secretarial work, accountancy, or domestic science, and administrative work of any kind. A few posts were also available for Personnel selection, meteorological, and education officers.

The W.R.N.S. is also getting its own Nursing Service. Wrens will be recruited gradually as sick berth attendants to replace V.A.Ds., who have been doing nursing duties where the W.R.N.S. are serving at home and abroad. In due course W.R.N.S. sick berth attendants will also relieve male sick berth attendants in naval establishments when required to do so by the Medical Director General of the Navy.

With the King's approval, the Clarence Barracks, Portsmouth, which have been taken over by the W.R.N.S. as their first permanent barracks, have been renamed the Duchess of Kent Barracks, after the present Royal Commandant of the W.R.N.S.

It was announced in a Fleet Order of November 13, 1947, that the Admiralty had decided to form, for the first time, a Women's Royal Naval Reserve, to be known as the W.R.N.R. The Reserve is open to women with a satisfactory record of more than 12 months' service in the W.R.N.S. who are prepared to be called up in the event of future emergency. There is no compulsory training, but voluntary training may be available for certain categories.

NAVAL AVIATION

On October 1, the Admiralty announced a new scheme for the recruitment of naval air pilots and observers. The age limits are 17 years 8 months to 20 years. Successful candidates are entered as naval cadets and are promoted to Midshipman after six months and to Sub-Lieutenant after about two years' total training. Service before promotion to Lieutenant depends on the results obtained in the courses. There Lieutenants (A) serve eight years on the Active List, followed by seven years on the

Emergency List. Some will have opportunities to transfer to permanent commissions. Those who leave the Active List after eight years will receive a gratuity of £700 free of tax. The first entry was due to be made in January 1949; the closing date for applications for this being October 15, 1948.

The scheme is in line with the new system of entry to the Royal Air Force, and marks the end of the system of Petty Officer air pilots, which was not a success.

Three R.N. Air Stations were closed down as part of the post-war economy. They were H.M.S. Kestrel (Worthydown), H.M.S. Goldcrest (Haverfordwest), and H.M.S. Fieldfare (Evanton).

Naval aircraft took part in the Fly Past over London on September 15, which commemorated the Battle of Britain in 1940, including the part played by R.N. pilots. Some forty pilots, then under training at the R.N. Fighter School, H.M.S. Raven, volunteered to fly with the R.A.F., and a similar number of torpedo-bomber reconnaissance pilots served with the R.A.F. bomber squadrons. In addition, two squadrons of Skuas, four of Swordfish, and one of Albacores were lent to Coastal Command at the time of the invasion of the Low Countries, and some of these squadrons continued in this duty during the Battle of Britain period.

Nine British aircraft—five belonging to No. 806 Naval Air Squadron and four R.A.F.—took part with nearly nine hundred American Service aircraft in the ceremony of dedicating the New York international airport at Idlewild early in August. The “fine and polished display” of 806 Squadron “made a profound impression on 200,000 people who saw the show,” to quote the congratulations of Rear-Admiral the Mackintosh of Mackintosh, Vice-Controller (Air).

PRIZE MONEY

A Draft Proclamation (Cmd. 7549, Stationery Office, 1*d.*) was issued on November 9, granting Prize Money for the late war to the Royal Navy, Royal Marines and the Royal Air Force. The amounts to be granted out of the proceeds of prize captured were £4 million to the Royal Navy and £1,250,000 to the Royal Air Force. Every naval officer and rating who had not less than six months' sea service to his credit before September 2, 1945, would be entitled to participate; the amount of his share would be determined by the rank held at that date, or on the date of his discharge. The scale varied from 10 shares for an Admiral of the Fleet, through 3½ shares to a Lieutenant, down to one share for an able seaman, ordinary seaman, boy, or private Royal Marines.

In a statement to Parliament on November 12 it was explained that the reason why the amount to be distributed was so small as compared to that available after the 1914–18 war was because the enemy had kept their ships in port when the war began and any ships not in port had orders to scuttle immediately if there was the least risk of capture. The proceeds of prize in the 1914–18 war granted to the Naval Prize Fund amounted to about £14 million.

There was also a very marked difference in the allocation of shares to rank as relating to the two wars. The Commander-in-Chief of the Grand Fleet received 1,000 shares; but under present-day legislation the

responsibility of the Flag Officer who might win or lose an action which would affect the whole course of a war is now apparently rated at no more than ten times that of the youngest sailor.

The Government announced that this will be the last occasion on which Prize Money will be awarded.*

MATERIAL

NEW CONSTRUCTION

The situation as regards new naval construction during 1948 can only be described as deplorable. The shaping of the Fleet of the future in the light of scientific developments and potential new weapons is, obviously, an extremely difficult problem, and it would be senseless to urge the Admiralty to build numerous warships which would be obsolete as soon as they were laid down. Nevertheless, it is clear that in any war that might come about within the next decade, the aircraft carrier will be indispensable for offensive operations and for the defence of convoys, and fast anti-submarine craft of the type of the destroyer will be needed in large numbers. Yet only one carrier, H.M.S. *Bulwark*, and one destroyer, H.M.S. *Decoy*, were launched during the year. It is true that two fleet carriers and ten light carriers have been under construction during the year, but of all these only the *Terrible* and *Magnificent*, both light carriers, have been completed, and the former has been taken over by the Royal Australian Navy and renamed H.M.A.S. *Sydney*, and the latter has been transferred to the Royal Canadian Navy.

Of the fleet carriers, the *Eagle* was launched in March, 1946; the *Ark Royal*, laid down in May, 1943, was not ready to take the water by the end of 1948. Six light carriers, the *Majestic*, *Albion*, *Centaur*, *Powerful*, *Hercules*, and *Leviathan* are afloat; a seventh, the *Hermes* (ex-*Elephant*), has not been launched. Three other light carriers have been cancelled. It was stated officially in December 1948 that constructional work on four aircraft carriers had been suspended, though work on one, the *Majestic*, was to be resumed shortly. The Explanatory Statement accompanying the 1948-49 Estimates† mentioned that the *Leviathan* was being preserved in an incomplete state at Portsmouth.

Eight "Daring" class destroyers are under construction; but only one, the *Decoy*, already mentioned, has been launched. Eight more of this class were cancelled at the end of the war. The last two destroyers of the earlier class—the *Alamein* and *Broadsword*—were completed during 1948. The Admiralty have disposed of ninety-eight destroyers since V.J. day, and thirty-nine new destroyers have joined the Fleet during the same period.

* Note: With this decision there should be little disagreement. Prize Money was a relic of the days when there was no permanent manning system for the Navy, and when both pay and pensions were unbelievably low. To-day, as after the 1914-18 war, it amounts to no more than an augmentation of the War Gratuity, and in order to distribute it on something resembling the old principles, a large office had to be kept in existence for some ten years, working out complicated calculations which were, in effect, entirely wasted labour. Provided the War Gratuity were fixed at an adequate figure, since it is paid promptly on discharge, none who serves could regret the disappearance of the army of clerks, whose artificially devised labours did no more than delay for years a substantial part of the naval man's gratuity. The proceeds of the Prize Court could then be paid direct to the Exchequer without further financial jugglery.—Ed.

† See p. 190.

The last three "A" class submarines—the Acheron, Andrew, and Artful—were completed during 1948. No new submarines appear to be under construction.

One frigate, the Morecambe Bay, has been completed; one more is building.

The completion of two surveying ships, a M.G.B., and a deep-diving vessel completes the record of new construction for the year. It only remains to add the further depressing fact that work on the cruisers Defence, Tiger, and Blake is still suspended.

SCRAPPING OF CAPITAL SHIPS

By contrast with the meagre programme and inertia of new construction, scrapping of major, if obsolete, ships of the war-time Fleet proceeded rapidly. On January 21, 1948, the following statement was made to Parliament:

"The battleship strength of the Royal Navy has been under review in the light of the age and condition of the ships concerned and their possible value in a future emergency. The useful life of a battleship is normally reckoned to be approximately twenty years. This period is calculated on a normal peace-time usage, and is greatly reduced when vessels are subjected to arduous war service.

"... the Admiralty has come to the conclusion that, of the capital ships remaining . . . the Queen Elizabeth, Valiant, Renown, Nelson, and Rodney are likely to be of the least value. The possibility of maintaining the battleships in reserve was taken into consideration, but they would be costly to maintain in this state, both in money and manpower. Moreover, if they were to be of any value in a future emergency they would need extensive refits and modernisation. . . . In particular their speed could not be increased to such an extent as to render them capable of taking their place in a modern fleet.

"In view of the above considerations, instructions have been issued that these vessels should now be scrapped."

A sequel to the signing of the death warrant for these grand old ships was the ceremonial farewell accorded to one of the most famous of them, H.M.S. Queen Elizabeth. On May 15, when her colours were lowered for the last time, Royal Marine bands beat the retreat on the Slip Jetty at Portsmouth, where she was discharging stores. As the ensign was hauled down the bands played a musical arrangement of "Sunset." "Auld Lang Syne" and the National Anthem concluded the ceremony, which was attended by the Commander-in-Chief, Admiral Lord Fraser, and a number of other senior officers. The Queen Elizabeth was subsequently towed to the Clyde for breaking up.

The same statement which made known the scrapping of the five capital ships also announced that a number of cruisers and smaller ships, all obsolescent or of little fighting value, were being disposed of. It was explained that this did not represent any new departure, but was a continuation of the process which had been going on since hostilities ceased of scrapping or selling redundant and out-of-date warships. The Admiralty were satisfied that it would not reduce the effective strength of the Navy below that required to meet any emergency which is likely to arise in the foreseeable future.

The following are the class and number of H.M. Ships (destroyers and above) given away or sold since August, 1945, or at present on loan, to Commonwealth and Foreign Governments:

<i>Ships</i>	<i>To Commonwealth Governments</i>	<i>To Foreign Governments</i>	<i>Total</i>
Light Fleet Carriers	2	2	4
Cruisers	3	1	4
Destroyers	7	22	29
Submarines.. ..	—	20	20

REPAIRS AND REFITS

Approximately a hundred and fifty ships, representing 50 per cent. of the Reserve Fleet have been refitted and brought forward to a better state of readiness for commissioning in case of emergency.

Modernisation of ships in regard to welfare improvements—better bathroom facilities, refrigerators, etc., has continued.

SHIP MOVEMENTS AND FLEET CRUISES

It had been announced from Buckingham Palace on March 5, that the King, accompanied by the Queen and Princess Margaret, would travel in H.M.S. Vanguard to visit New Zealand and Australia in the early part of 1949. The Vanguard, in which the Royal Party took passage to South Africa in 1947, was due to be operational again in September, 1948, after a long refit. It was with profound regret in the Navy and disappointment in the Vanguard that the news was received, on November 23, that, on medical advice, His Majesty had agreed to cancel all his public engagements over a period of some months and to postpone indefinitely the visit to the two Dominions.

H.M.S. Vanguard had already completed to full commission and was doing a shakedown cruise in the Mediterranean prior to giving Christmas leave and preparing for the Royal Tour. It was decided that she should remain in commission and join the Mediterranean Fleet in the New Year.

NORTH SEA EXERCISE

What was described as “the largest sea and air exercises since 1939” took place in the North Sea between May 12 and 16. They were known as Exercise “Dawn,” and nineteen surface ships and eight submarines took part. An “enemy” (Redland) Fleet, including the training battle-ships Anson and Howe and the aircraft carrier Implacable, was commanded by Rear-Admiral the Hon. Guy Russell, Flag Officer Commanding the Second Cruiser Squadron, in the Superb. Admiral Sir Frederick Dalrymple-Hamilton, Flag Officer Commanding, Scotland and Northern Ireland, and Air Vice-Marshal Kingston-McCloughry, Air Officer Commanding No. 18 Group Coastal Command, were jointly in command of Blue-land’s naval and air forces. The enemy was assumed to be heading for the Atlantic to attack shipping and a force of submarines was stationed off the Orkneys to intercept. As soon as the enemy was sighted, eighteen Lincoln bombers, escorted by a squadron of Hornet fighters, went out to attack. Blue-land naval aircraft followed the high-level bombing with a rocket attack on the destroyer screen and a torpedo assault against the larger enemy ships. The exercises were reported to have been very successful and instructive.

HOME FLEET CRUISE

On September 23, the Home Fleet, having partially recovered from the effects of the "run-down" earlier in the year, was able to go to sea on an autumn cruise. The Fleet included the battleship Duke of York, flying the flag of the Commander-in-Chief, Admiral Sir Rhoderick McGrigor; three aircraft carriers, the Theseus, Vengeance, and Illustrious; three cruisers, the Diadem, Cleopatra, and Sirius; and a number of destroyers, frigates, and auxiliary vessels.

The First Lord, Viscount Hall, took passage in the flagship to Trinidad, returning home by air.

For the first three days exercises took place, in which the First and Second Motor Boat Flotillas of Coastal Forces and aircraft of the Fleet and of Bomber and Coastal Commands took part. Later the Illustrious and some of the smaller craft returned to home ports. The Duke of York, the three cruisers and attendant destroyers proceeded on their cruise to the West Indies; the remaining two carriers with destroyers paid a visit to South Africa, and some destroyers to West African ports. The Duke of York, escorted by the St. James, went on to visit Norfolk, Virginia, where Admiral McGrigor transferred his flag to the destroyer and went up the Potomac River to pay official calls. The opportunity of the visit to South African waters was taken to carry out exercises in which the South African frigates Natal and Transvaal took part.

En route homewards, early in December, the carrier Illustrious with five destroyers joined up off the Azores, and as the Fleet approached the United Kingdom, comprehensive exercises were carried out with other naval forces, including naval aircraft, and with aircraft from Bomber, Coastal, and Fighter Commands. The exercises included the simulation of attacks on the Fleet with atomic bombs.

MEDITERRANEAN CRUISES

The Mediterranean Fleet left Malta for the spring cruise on February 17. The Fleet consisted of the aircraft carriers Triumph and Ocean, seven destroyers, three submarines, three frigates, and two sloops. It was commanded by Vice-Admiral Sir Thomas Troubridge, Flag Officer (Air) and Second-in-Command Mediterranean.

During a second cruise in the summer, ships of the Fleet visited ports in Turkey, Greece, Cyprus, the Dodecanese, Egypt, Sicily, Italy, Corfu, Tunis, and other parts of the Mediterranean. Vice-Admiral Troubridge in the Triumph visited Smyrna from July 6 to 10, from which port naval aircraft flew to Ankara and Istanbul. The cruiser Euryalus and two frigates visited Istanbul during the same week. Admiral Sir Arthur Power, Commander-in-Chief, in his flagship, H.M.S. Liverpool, joined in the cruise.

The Mediterranean Fleet left Malta again on September 7 for an autumn cruise, calling at ports in France, Italy, Sicily, Tunisia, Sardinia, and Corsica. Admiral Power flew his flag in H.M.S. Surprise.

AMERICA AND WEST INDIES

Ships of the America and West Indies Squadron left Bermuda on January 2, for their second winter cruise since the end of the war. At the

end of March, ships of the Royal Canadian Navy joined up for combined exercises under Vice-Admiral Sir William Tennant, flying his flag in H.M.S. Sheffield. In company were H.M. sloop Sparrow and the Canadian cruiser Ontario and destroyers led by H.M.C.S. Nootka.

During a summer cruise, between July and October, Admiral Tennant in the Sheffield visited Esquimalt, Vancouver, Comox, Seattle, and San Francisco. During a visit to Acapulco, the C-in-C. and a party of officers and ratings visited Mexico City. The sloop Snipe took Lord Baldwin, Governor of the Leeward Islands, on a tour of the Islands. The church in which Nelson was married at Nevis was visited; also, at the Governor's request, Dead Man's Chest—an islet in the Virgin Group, where fifteen men with a bottle of rum were landed, but no treasure was found.

PACIFIC

The activities of the British Pacific Fleet included a summer visit to Japanese ports. In company were the cruiser London, flying the flag of the Commander-in-Chief, Admiral Sir Denis Boyd, the cruiser Sussex, four destroyers, and a sloop. On October 31 it was announced from Headquarters of the Far East Station at Singapore that H.M.S. Cossack had rescued 1,270 Chinese troops from the transport Yinghung, which had run aground in Masu Bay, west of Keeling, in Formosa. It was reported later that Lieutenant-Commander W. Dennis, R.N., swam through rough seas to secure a lifeline, and that he and Lieutenant A. Whitehead, R.N., had led the two rescue parties, who rigged jackstays and lifelines between the wreck and the shore.

POLAR WATERS

It was announced in December that early in 1949 the aircraft carrier Vengeance, with two destroyers, a "Loch" class frigate, a submarine, and an oiler, would sail on an experimental cruise in the North Atlantic and Arctic to study the effects of very cold weather conditions on the ships' companies and material. A specially equipped air group was to embark in H.M.S. Vengeance. The effects of very cold weather on the functioning of weapons would be studied, and naval surgeons and psychologists would be concerned with the human reactions. The operations were to last about six weeks.

In the Antarctic, during December, the sloop Sparrow (Commander J. V. Waterhouse, D.S.O., R.N.) made a cruiser round British possessions in company with the Falkland Islands Dependencies surveying ship John Biscoe, which had arrived from England in the previous month with reliefs, stores, and mail for the Antarctic bases. The two ships reached the South Orkneys on December 3, the earliest recorded date in the summer for a visit by ships to those parts. Signey Island, Admiralty Bay (South Shetlands), and Deception Island were visited, and in the strait between Elephant Island and Cornwallis Island, uncharted and unnamed, the vessels ran the first line of soundings for those waters.

THE WITHDRAWAL FROM PALESTINE

An event of historical importance and strategical significance was the withdrawal of the last British forces from Palestine on June 30. After

thirty years of occupation the British Mandate was legally ended on May 15, 1948, when the High Commissioner, General Sir Alan Cunningham, left Haifa in H.M.S. Euryalus. The final embarkation was covered by the Royal Navy and Royal Air Force. It took place in one morning when the 1st Guards Brigade and attached troops, two Royal Marine Commandos and certain ancillary services were taken off in four merchant ships, six L.S.Ts., a hospital ship, and some "Z" craft. The last group to leave was the 40th Royal Marine Commando, and the last British soldier the G.O.C., Lieut.-General G. H. A. MacMillan, who embarked in H.M.S. Phoebe. Just before the cruiser left, aircraft from H.M.S. Triumph flew past in a formation salute. Two destroyers and a frigate, in company, cheered ship as the Phoebe passed en route for Port Said.

On completion of this rather delicate and dramatic operation, the Secretary of State for War sent a congratulatory message to the G.O.C., and the Admiralty sent the following signal to the C.-in-C. Mediterranean, Admiral Sir Arthur Power:

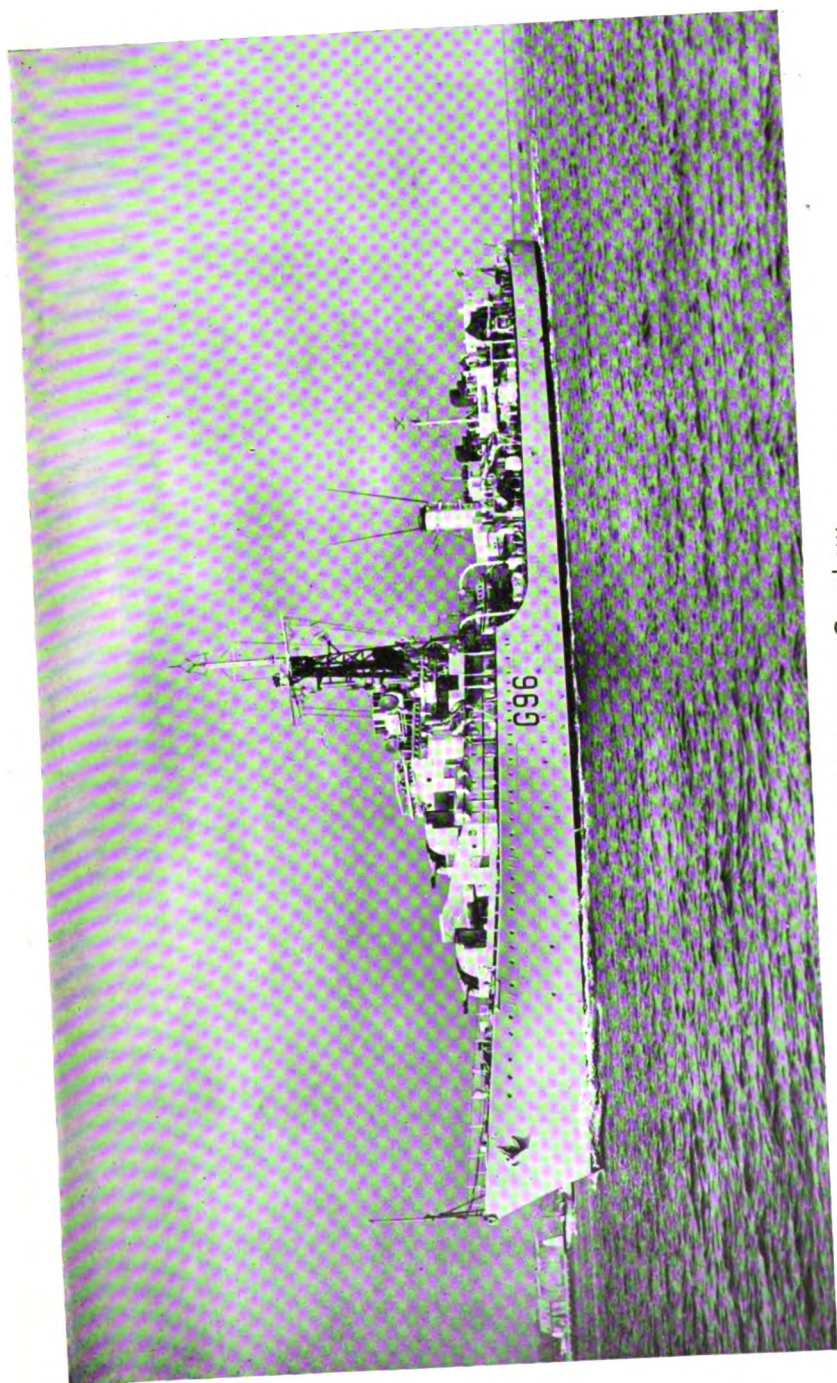
"On the successful completion of the withdrawal of British personnel from Palestine, the Board convey to you and to those concerned serving under you, their appreciation of the manner in which this and other difficult tasks in Palestine have been carried out. They are aware that much credit is due to Commodore A. T. G. C. Peachey (Senior Naval Officer), and they commend the high morale and unassuming efficiency displayed by the Royal Marine Commandos."

RESEARCH AND MATERIAL DEVELOPMENT

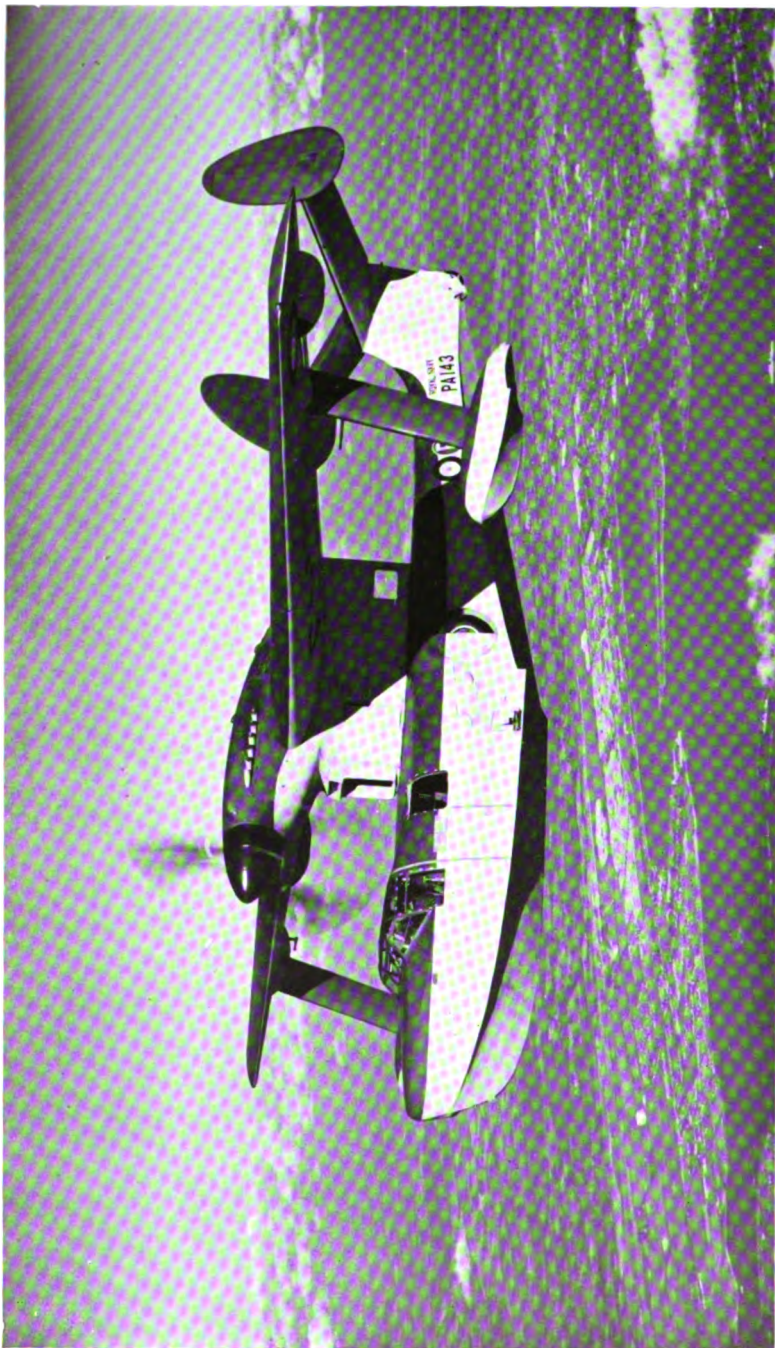
A large proportion of the 1948-49 Estimates was allocated to research—£9 million, as compared with £700,000 in an average pre-war year. A substantial part of this research is being devoted to ascertaining the effects of the atom bomb, including the protection of crews against its heat and radioactive effects. Action is being taken along the lines of enclosing bridges, gun mountings, and other superstructure, and consideration is being given to the abolition of some of the latter.

A programme of trials to discover the effects on ship structures of "near misses" was carried out in Loch Striven. A cruiser, three destroyers, and an ex-German destroyer, as well as some small craft, were used for these tests, which included the explosion of bombs, torpedoes, and mines at various distances from the hulls.

The "snort"—the means for taking in air to enable submarines to continue to use their Diesel engines when submerged to a limited depth—was further developed by experiments and trials. One of the most interesting was that carried out by H.M.S. Alliance. This submarine submerged at a point 100 miles south of the Canaries; from there she shaped a course down to the Equator and then back to Freetown—a distance of over 3,000 miles, remaining under water the whole time. Another important experimental cruise was that made by the submarine Ambush in northern waters, one of the objects being to test the "snort" in Arctic conditions from the point of view of under-water endurance and the effect on the health and efficiency of the crew, particularly as regards pressure variation on the ear, nose, and throat. It was subsequently reported that "snorting" produces no permanent ill effects. Alternative methods of submarine propulsion has also been investigated with promising results.



H.M. Destroyer Crossbow
Courtesy of Messrs. Thornycroft



British naval aircraft—Seagull Amphibian

Courtesy of Messrs. Vickers-Armstrongs

Progress has been made in the development of the gas turbine engine. Although this has so far been confined to relatively small warships, notably M.G.B. 2009, which carried out successful trials at Spithead in July, it is suggested that this form of propulsion may, in time, supersede steam completely.

The largest Admiralty research establishment, previously known as the Admiralty Signal Establishment, became the Admiralty Signal and Radar Establishment on New Year's Day 1948. Its activities now include all aspects of electronics as they relate to naval communications, aviation, and weapons of diverse types.

A series of anchor trials have been carried out under the supervision of the Director of Naval Construction, Sir Charles Lillicrap. Tests were made on Chesil Beach, near Portland, of a new 5½-ton anchor capable of withstanding a pull of more than four times its own weight and reputed to be four times as efficient as old types. Tests were also made of a 10,000-lb U.S. Navy anchor and of a 750-lb anchor of the type used for kedges in the Normandy landings. The latter, it is claimed, can hold against twenty times its own weight.

NAVAL MEMORIALS

The Admiralty announced on July 1, the establishment of a memorial fund in commemoration of the 529 ex-Dartmouth Cadets and staff who lost their lives during the 1939-45 war. The memorial will take the form of a Book of Remembrance containing the names of the fallen, similar to that made after the 1914-18 war; the redecoration and extension of the College Chapel lobby to form a suitable setting for these books; and a fund to help, where necessary, in the education of children of ex-Cadets of the College who have been killed, have died or become permanently disabled while on active service.

A bronze tablet in memory of the 833 officers and men who lost their lives when H.M.S. Royal Oak was torpedoed in Scapa Flow by a German U-boat on October 14, 1939, was unveiled in St. Magnus Cathedral, Kirkwall, Orkney, on the ninth anniversary of her loss by Rear-Admiral W. G. Benn, who was Captain of that battleship at the time.

The landings of the Royal Marines on the island of Walcheren, early in November, 1944, were commemorated on November 25, 1948, when Princess Wilhelmina (the former Queen of the Netherlands) planted the first tree of what is to be a small village park. General Sir Dallas Brooks, Commandant-General, Royal Marines, planted another tree.

Admiral of the Fleet Lord Chatfield unveiled a memorial in the Gunnery Instructors' mess of H.M.S. Excellent, Whale Island, to their messmates who fell in the war. This ceremony was performed, very appropriately, on December 4, St. Barbara's Day, as the patron saint of Gunnery.

The most important naval ceremony during the year was that when, on Trafalgar Day, October 21, very belated final honours were paid to Admirals of the Fleet Lord Jellicoe and Lord Beatty. The Duke of Gloucester, who was accompanied by the Duchess, unveiled the memorial busts placed on the north side of Trafalgar Square, and delivered an address.

The ceremony was most impressive and worthy of the occasion. A

representative parade of about 2,500 included, beside a naval contingent, the massed bands of the Royal Marines, contingents of Welsh Guards, and State Trumpeters of the Household Cavalry in full dress, an R.A.F. detachment, ex-Service men (including about eighty shipmates of Jellicoe and Beatty), and representatives of naval reserve forces, the W.R.N.S., and youth organisations associated with the sea. The memorials were dedicated by the Archbishop of Canterbury.

His Royal Highness's Address was as follows:

"It is an honour to me, as a soldier, to be asked to unveil this memorial to two great sailors.

"Lord Jellicoe joined the Navy in the days of sail. Forty years later, at a supreme crisis in our history, he was called to command the greatest concentration of sea power which the world had ever seen.

"In those forty years, before the coming of aircraft, the change from sail to steam had so quickened the conduct of war at sea that when he assumed command there was placed upon his shoulders a personal responsibility, day by day, the like of which has been borne by no other man in the history of war. A statesman wrote of him at that time 'Jellicoe was the only man on either side who could lose the war in an afternoon.' He did not fail us.

"After the Armistice and after many years as the beloved Governor-General of New Zealand, he came home to succeed Lord Haig in the British Legion. Countless ex-Servicemen are grateful for his goodness of heart and for the selfless devotion of the last years of his life.

"Lord Beatty was his great fighting subordinate. He was the youngest admiral since Nelson, and he will always be remembered for his command of the battle cruisers—in those days the cavalry of the Fleet—at the Battles of Heligoland, the Dogger Bank, and Jutland.

"When Jellicoe went to the Admiralty, Beatty succeeded him as Commander-in-Chief of the Grand Fleet, and so in his hands lay our defence upon the sea during the last two years of the First World War. Then he too became First Sea Lord. He held that great office for longer than any other man has done in modern times, and it was he who laid the foundations of the new Navy which was not found wanting in 1939.

"Together Jellicoe and Beatty led the Royal Navy through the last crisis of the long centuries when sea power depended upon ships and seamen alone. Their names bridge the gulf between the classic tradition of Trafalgar and the onset of total war as we know it to-day. They were buried in St. Paul's Cathedral twelve years ago; but it is right that we should do them this final honour here in Trafalgar Square, beside the monument of our greatest seaman and on the anniversary of his greatest victory."

E. A. ALTHAM

CHAPTER III

Foreign Navies

THE YEARS 1947 and 1948 have, in the main, been devoted to modest consolidation on the part of the smaller foreign navies, to intensive research and development in the case of the United States, which still retains her position as the world's first naval power. There is still a tendency in what are loosely known as the "Western Powers" to suspend new building as far as possible until the shape of future naval war becomes more apparent. On the other side of the Iron Curtain, rendered even more opaque by a rigid policy of secrecy, an opposite tendency is apparent. New building is going on apace, mainly on ships and weapons evolved towards the end of the war and largely untried in action.

It is difficult at this stage to hazard a guess as to what the composition of navies will be like some years hence. Research is concentrating mainly on the three new major weapons produced during the last war—the controlled missile, the fast submarine, and the atomic bomb. And until the full possibilities of them all are known, the design of new ships of war must remain something of an enigma.

These considerations affect mainly those countries with the larger and more important navies. The smaller nations have taken the opportunity, brought about by the continued reduction from a war-time to a peace-time strength of the major navies, of replacing their out-of-date vessels with more modern ships purchased from the redundant stocks of Great Britain, the United States, and Canada. Some of the smaller and remoter countries, too, have discovered for themselves the attractions of a naval squadron, and have blossomed out as maritime powers, where before they had been content to depend on stronger neighbours.

This tendency to re-equip navies with second-hand ships at bargain prices has had its reflection in the British building yards, which used to obtain a substantial portion of the orders from foreign powers for new construction. There are practically no new warships now being built in this country for foreign countries. It seems probable that this state of affairs will continue for some time to come until the surplus of warships of the major powers has either been absorbed or scrapped.

UNITED STATES

The appropriation bill for the United States Navy for the fiscal year 1948 (July 1–June 30) amounted to \$3,935,100,000 (£983,775,000), allowing for cash transfers from previous years, and the figure for the fiscal year 1949 is \$5,111,600,000 (£1,277,900,000), a considerable increase. The 1948 figure was designed to include the "re-activation" of 277 major vessels and 486 smaller craft, at the time preserved in various yards round the coast. This would have given the U.S. Navy an active fleet of 763 ships and an inactive reserve of 1,930 vessels, but a budget cut in February 1949 envisaged the laying up of a further 72 vessels, which was to include three fleet carriers, nine light fleet carriers, and three anti-

aircraft cruisers. Even with this further reduction, however, the U.S. Navy remains, by a very substantial margin, the most powerful in the world.

The total naval personnel during 1948 was 45,534 officers and 378,944 enlisted personnel, not including the Marine Corps. During the year 113,160 new personnel were recruited for the navy, but some 240,000 men completed their service under the two-year contract scheme in force after "V-J" Day, few of whom re-engaged for a further term. Figures for the Marine Corps for the same year were 7,001 officers and 78,530 enlisted personnel. In spite of a well-organised advertising campaign, regular recruitment has been falling off in numbers.

The present manpower shortage has been considered sufficiently critical for the passage through Congress of a selective service bill, which was signed by the President on June 24, 1948. Both the Navy and the Marine Corps expect to gain sufficient voluntary enlistment without having recourse to the selective service act, but it remains as a valuable stand-by should volunteers not come forward in sufficient numbers.

In November, 1947 Admiral Louis E. Denfeld succeeded Fleet Admiral Chester W. Nimitz as Chief of Naval Operations on the latter's retirement on reaching the age of sixty-two. Admiral Denfeld had been Commander-in-Chief, Pacific Fleet, and his successor in that command was Admiral D. C. Ramsey. Admiral W. H. P. Blandy remains as Commander-in-Chief, Atlantic Fleet, and Admiral Richard L. Conolly is Commander-in-Chief of U.S. Naval Forces, Eastern Atlantic and Mediterranean.

The United States chain of bases in the Pacific has been reduced by the return to Australia of Manus, in the Admiralty Islands Group. This had been leased during the war and fitted as a major fleet and fleet repair base. All the installations were sold to Australia when the base was returned, and the Dominion is to use it as the R.A.N. advanced fleet base in the New Guinea area. The proposal to establish a base in the southern islands of the Philippines Group is still under discussion between the two Governments, and major work has been undertaken on the construction of a permanent fleet base at Adak and Attu in the Aleutian Islands. There has been a report that Okinawa may be developed as a naval base, but no official decision has yet been announced. This would entail the retention of Okinawa, formerly a Japanese island, and until the terms of the eventual peace treaty with Japan are known, the truth of the report must remain pure conjecture. For the rest, Pearl Harbour, Guam, and a base in Alaska complete the strategic chain in the Pacific.

It was announced during the past year that a further test had been carried out with an atomic bomb and that the result had proved completely satisfactory. The explosion was, according to the brief statement issued, considerably more powerful than either of the two at Bikini. The test was carried out at Eniwetok Atoll, in the Marshall Islands, and was conducted by a joint task force from all Services. Naval participation included supporting vessels and specially qualified personnel, but it is not known whether any ships were in the immediate explosion area when the bomb was detonated.

A list has been issued showing the ultimate fate of the ships used in the Bikini experiments. Among those sunk or scuttled are the battleships Nevada, New York, and Pennsylvania, the cruisers Pensacola and Salt

Lake City, the destroyers Hughes, Mayrant, Mugford, Ralph Talbot, Rhind, Stack, Trippe, Wainwright, and Wilson, and the submarines Apagon, Pilotfish, and Skate. The aircraft carrier Independence is now used as a radioactive laboratory at San Francisco, and the two submarines Dentuda and Parche are back in service.

The past two years have seen an intensified research into the development and effect of guided missiles and of the fast submarine. From the fog of contradictory and sometimes bombastic statement it would seem that progress in both directions has been slow but steady. Such statements as that made by Mr. Glenn L. Martin, a prominent builder of aircraft both for the Army and Navy, that "the United States Navy has perfected guided missiles. We can now sink a ship even if it is half-way across the ocean. All we have to do is to get our own ships out of the way," would appear to be over-optimistic, and a more realistic view is probably that of Mr. Sullivan, Secretary of the Navy, when he says "although it should be re-iterated that guided missiles and other appurtenances of push-button warfare are still far from the operational stage, recent developments have exceeded expectations."

Speeds of up to 5,000 m.p.h. have been claimed for U.S. rockets of the V.2 type, and a recorded height of 237 miles has been obtained, though this is believed to be with a version of the "Tiny Tim," fired automatically from a parent rocket at approximately ionospheric height. A V.2 type rocket was successfully fired at sea from the flight deck of U.S.S. Midway, and a V.1 type of pilotless missile has been launched from the deck of a submarine. On the other hand, work on the two new capital ships, the 45,000-ton battleship Kentucky and the 27,500-ton battlecruiser Hawaii, both of which were designed for the employment of rockets or guided missiles as main armament in place of the more normal guns, is still suspended, which does not argue a sufficiently forward state of development in the new weapons to justify completion of these two ships just yet.

Even less information is available about development work in connection with the fast submarines. It has been stated on several occasions that the new U.S. submarines will have submerged speeds of from 20 to 25 knots, partly by means of the German Walther type engine, on which a number of tests have been carried out with surrendered German U-boats, and partly by means of stream-lining the hulls and substituting more powerful electric batteries and motors.

Experiment in anti-submarine measures against boats with the increased speed has been proceeding throughout the year, though from the few reports of progress achieved it would seem that the United States are faced with the same difficulties as this country. Mr. Forrestal, the late Secretary for Defence, in his report to the President said that first priority in naval research was being given to problems posed by the Schnorkel and by high underwater speed, an indication that the U.S. authorities have not yet found the full answer to a submarine campaign of the future, carried out with modern boats.

This problem continues to exercise the U.S. Navy Board, especially whenever the Communist bogey is raised. The Secretary of the Navy, Mr. Sullivan, stated in Congress that official U.S. estimates of Soviet naval strength include more than 250 modern submarines and immediate reactions were to authorise the construction of two prototype "hunter-

killer" destroyers, whose sole role is the active pursuit and destruction of submarines, and also "a small submarine of special purpose," designed as an anti-submarine submarine, to hunt when submerged, and believed to be something on the lines of the British R-class boats of the First World War. They, it will be remembered, had the then unusual submerged speed of 17 knots, developed through the employment of a K-boat's motors and batteries in a tiny streamlined hull.

A measure of U.S.-British co-operation in this field was the joint exercise in the summer of 1948 in the Caribbean Sea, in which H.M. Ships Battle-axe and Crossbow were engaged with United States destroyers and the 18-knot American submarine Amberjack in extensive trials of modern A/S equipment. A general statement issued after the exercise to the effect that the trials were a great success was too vague and guarded to throw any light on the details of the combined exercise.

Two new developments on which U.S. research has produced operational results are the system of computation known as "Radac," and the development of a fully automatic 3-in. twin mounting. Radac (rapid digital automatic computation) is, in the words of its sponsors, "a technical revolution in the field of automatic computers which will result in equipment of almost unlimited accuracy and many hundreds of times the capacity of any previously developed." It is designed for use in fire and missile control, communications, logistics, in the "Combat Intelligence centre," and other information systems. It is eventually, it is understood, to be fitted in all ships of cruiser size and upwards.

The automatic 3-in. mounting is fitted with radar control, which will, it is stated, automatically pick up an enemy aircraft or missile, compute and set the fire control settings, and open fire at effective range. It is considered that the speeds of contemplated missiles will be such that there will be no time for the many human operations hitherto connected with the firing of a gun and that they must be eliminated by making most of the processes completely automatic. It is believed that this automatic mounting has been fitted as secondary armament in the new 14,700-ton "light" cruiser Worcester.

Another project on which work has continued through the year is the "walking barge," an amphibious vehicle capable of negotiating mud flats of extremely low bearing capacity. It is an ingenious machine consisting of two pontoon sections, one enclosing the other, which alternately lift the barge forward. It should have many potential uses, such as landing supplies over mud foreshores, laying prefabricated road sections, serving as a mobile platform for building water-front structures, laying pipes, and so on.

Research has been continued with the aim of improving the jet-propelled torpedo, first demonstrated about two years ago. Then, its maximum range was half a sea mile and its speed about 70 knots. No new performance figures have been made public, though it is reasonable to presume that some advance has been made during the intervening years. There is no suggestion yet that this is anything but an aircraft torpedo. It is not known whether further developments have been made in the proximity fuze designed for torpedoes. Its trials were extremely successful and further development would presumably be in the direction of modifying its initial sensitivity in order to withstand higher firing speeds.

It was officially reported during 1948 that the strengths of the two main fleets were as follows:

Atlantic.—6 fleet carriers, 2 light fleet carriers, 4 escort carriers, 1 battleship, 16 cruisers, 71 destroyers, 8 destroyer escorts, 41 submarines.

Pacific.—5 fleet carriers, 3 escort carriers, 1 battleship, 15 cruisers, 64 destroyers, 5 destroyer escorts, 35 submarines.

In addition there were 667 major units in reserve, 516 miscellaneous units on active service, and 1,263 in reserve.

Since these figures were published it has been announced that the 45,000-ton battleship Iowa has been paid off and reduced to reserve, leaving only the Atlantic fleet with a battleship, the Missouri, of similar tonnage.

For the first time, in the wording of the report, aircraft carriers were given precedence over battleships, a form which may be taken as a guide to current American naval thought. This has been borne out by Mr. Sullivan in Congress, when he stated that he believed the two most important parts of any Navy to be naval aviation and submarines, and by Admiral Denfeld, who said: "The fleet which we maintain to-day is essentially an air striking force; with its accompanying logistic support ships. . . . We are concentrating on surface-to-air and surface-to-undersea probabilities as far as combat at sea is concerned."

There has been evidence during the last year of a gradual shifting of naval strength from the Pacific to the Atlantic. This can be attributed, no doubt, partly to the fact that the greater part of Russian naval strength is concentrated in her western ports and partly as a visible sign of power for the encouragement of those nations joining the North Atlantic Pact.

A big fleet exercise was carried out at the beginning of 1949 under the command of Vice-Admiral Duncan in the Missouri, which included an assault landing at Argentia, Newfoundland. Similar trial landings had been practised previously under realistic conditions on islands in the Caribbean Sea, but on this occasion the defence was allotted eight submarines with which to counter the attacking ships, of which no fewer than 100 of all types were employed. Only press reports are so far available on the results of the exercise, but these are unanimous in proclaiming that the submarines completely broke up the assault before it could gather any momentum and that only a very small percentage of landing ships managed to get through the submarine screen.

The year under review has also seen a number of exercises in Arctic waters, especially with submarines. The object has been mainly to test equipment in conditions of extreme cold, and also to try out the possibilities of establishing a chain of "radar picket vessels" to give warning of the approach of hostile aircraft or missiles. This was envisaged in Fleet Admiral Nimitz's statement of United States sea power, made on his retirement in November, 1947.*

It has been decided that all battleships and cruisers are to be fitted with permanent helicopter platforms, all the previous float planes being replaced. In this connection, an order has been placed with Sikorsky and Bell for 125 of these machines. They will have a ceiling of 19,000 feet and a speed of 95 knots.

* *Vide* "Brassey," 1948, p. 533.

The U.S. Marine Corps is being re-organised on more modern lines. General A. A. Vandergrift, Commandant of the Corps, is making the Corps more flexible for fast-striking power, and it is being re-equipped with new weapons as they reach the production stage after development. This, it is stated, is "to provide for the possibility of atomic warfare," though it is difficult to understand the connection between the traditional role of the U.S. Marines and atomic warfare, unless some sort of atomic tactical weapon is evolved. There are no indications yet that this has come about. The Marine Corps has also been experimenting with helicopters for the evacuation of wounded.

The "dehumidification" system of preserving ships has proved most successful. A five-year schedule of overhaul of laid-up ships has been inaugurated, together with a regular system of inspection. Those made so far have disclosed an excellent state of interior preservation. One difficulty encountered is that of space and the berthing areas have been filled to capacity. In addition there has been an encroachment on industrial space in the naval shipyards, and this is likely to extend as future heavy ships are laid up.

It has been officially decided that the motor torpedo boat has no useful place in the U.S. Navy, and the many hundreds built during the war have been scrapped, only four being retained for instruction. The official view is that they proved of little value in the Pacific and paid much smaller dividends than submarines.

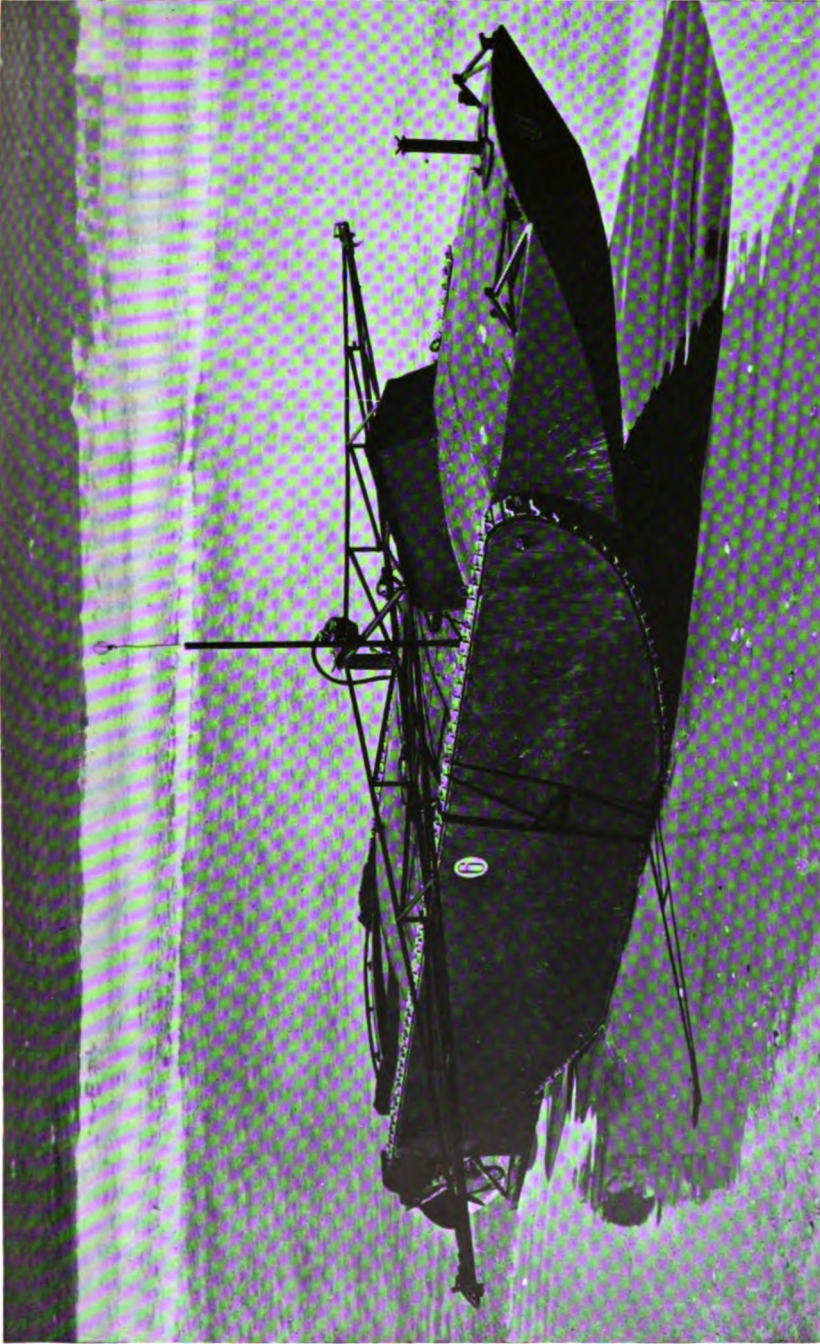
Two war-time shipyards and 64 industrial plants were scheduled for disposal during 1948, leaving 57 shipyards and 32 plants still in the Navy's hands. Fifteen yards and 17 plants are being retained as reserve facilities for the Navy.

During 1948 the United States maintained Naval Missions with the following countries: Brazil, Chile, Colombia, Ecuador, Peru, Venezuela, Argentina, Greece, Turkey, Philippine Islands, and China.

BATTLESHIPS

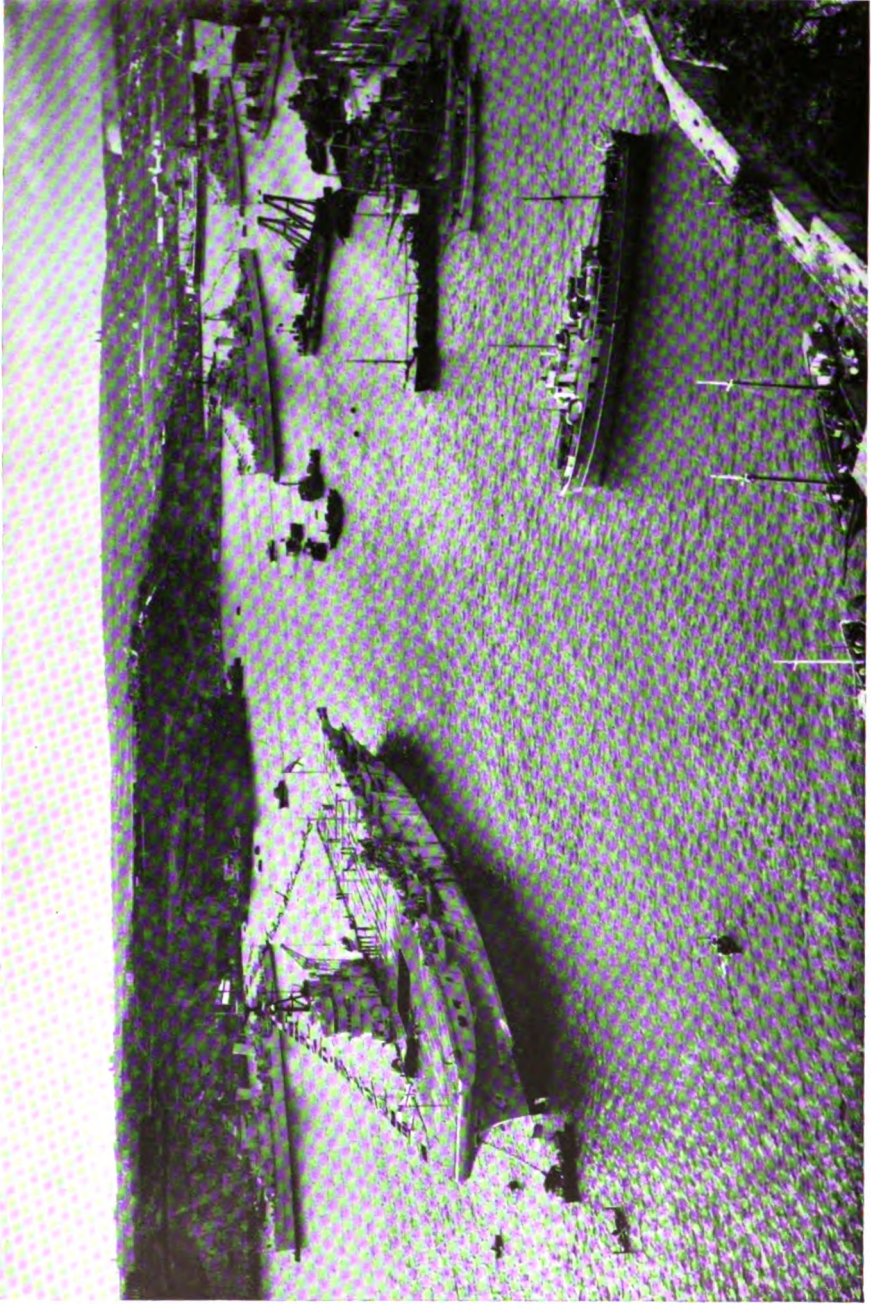
Only one battleship now remains in full commission, the 45,000-ton Missouri, the Iowa being reduced to reserve during the past year. This leaves fifteen battleships now in a state of preservation. Work on the 45,000-ton Kentucky was resumed during 1948, but it is believed only in order to reach a stage where she could safely be floated out of the dry dock in which she was being built. She is now 69 per cent. complete. No further work has been carried out on the 27,500-ton battlecruiser Hawaii, now 82 per cent. complete. Both these ships, together with some destroyers and submarines, are eventually to be equipped with rockets or guided missiles and the decision to suspend building is to await the results of trials now being carried out in the Norton Sound (see under carriers) and other vessels.

The present U.S. conception of the value in future war of the battleship still remains unstated, though it seems to have concentrated on the use of the battleship mainly as an A.A. escort for fleet carriers, the speed of the new aircraft now being developed calling for longer range and heavier guns than can be accommodated in any other type of vessel.



An invasion "Drone." A radio-controlled amphibious "Salamander," carrying a charge of 1,200 lbs. of explosive, designed for clearing beach obstacles

U.S. Official Navy Photograph



British naval bases—Grand Harbour, Malta
Associated Press Photograph



American Heavy Cruiser U.S.S. Des Moines, 17,000 tons, nine 8-inch guns
U.S. Official Navy Photograph



A projected giant carrier. A forecast of the intended appearance of the American 65,000-ton carrier
(Note :—Construction of this ship has been suspended)

U.S. Official Navy Photograph

AIRCRAFT CARRIERS

Two major decisions have been taken during the two years under review, the first being to lay down a "super" carrier of 65,000 tons, and the second some eighteen months later, to cancel her building after preliminary work had been started. Her cancellation was due, according to press statements, to the insistence by the Air Force that all strategic bombing must be carried out by them and not by the Navy.

The vessel would have been a most interesting addition to the U.S. Navy. She was being built by the Newport News Shipbuilding and Dry-dock Company, and preliminary details indicated that she would have a waterline length of 1,030 feet, a beam of 190 feet, and a speed of 33 to 34 knots, produced by engines developing 280,000 s.h.p. Her initial cost was to have been \$124,468,000 and she would have taken four or five years to build. Her beam would have prevented her passing through the Panama Canal—the seventh U.S. warship with this handicap.

In many ways she would have been a novel carrier, and she had been described as incorporating the wartime recommendations of carrier task force commanders in the Pacific and as representing a further step in the normal evolution of the carrier-type vessel. She was to have embodied a method of widening her flight deck to a total width of 236 feet by hinged extensions along both sides. The deck itself was to have been completely flush, the usual "island" being omitted, and in place of this she was to have been fitted with a telescopic bridge, and similarly operated radar and D/F masts. No official statement had been made as to how her exhaust gases were to be discharged, but this would almost certainly have been done through horizontal funnels on both sides of the flight deck, since exhausts fitted abaft the deck would have the effect of producing a pocket of lighter air which seriously affects landing-on.

She had been designed to operate the largest type of U.S. bomber, the B.29, which is capable of carrying atomic bombs. Her flight deck was to have been specially strengthened to withstand a landing thrust of 500,000 lb. An unusual feature was the provision of only one lift, right aft, which might have been thought to present some difficulty when handling heavy bombers, especially in a seaway. The range of operation of her prospective aircraft was said to be 1,900 miles.

It had been stated that, although she would normally have taken some four or five years to build, she could have been completed in an emergency in 32 months, and that sister ships could be produced in about two years each.

The decision to cancel the ship was followed almost immediately by the resignation of Mr. Sullivan, the Secretary of the Navy, stated to be in protest against the decision.

The fleet carrier *Ranger* has been sold for scrap, and the escort carriers *Admiralty Islands*, *Kitkun Bay*, and *Tulagi*, of the "Casablanca" class, removed from the effective list. The completion of the *Coral Sea* brought to an end the first super-carrier programme, and of the *Valley Forge*, the "Essex" class programme. The *Oriskany*, formerly of the "Essex" class, is due to be completed to a revised design by January 1, 1950.

The seaplane tender *Norton Sound* (9,090 tons) has been taken over as a trial ship to test guided missiles and has been fitted with a specially

strengthened deck and other special equipment. It has been reported that a number of other carriers are being taken in hand for deck strengthening in order that they will be able to operate heavier aircraft.

CRUISERS

It has been decided to cancel the building of the heavy cruiser Dallas. She was laid down in 1945 at the Bethlehem Steel Yard Co.'s yard. This is the ninth cruiser of the "Des Moines" class to be cancelled, leaving only three, the Des Moines herself, Newport News and Salem. Of 17,000 tons, they carry nine 8-inch guns and twelve 5-inch, all of which are fully automatic, firing cased shell. It has been officially stated that the rate of fire of these guns is four times that of any other guns of the same or greater calibre using cased ammunition. The 5-inch guns are mounted in pairs and a number of 3-inch and smaller A.A. pieces are carried. The Des Moines, first of the class to be completed, was commissioned on November 16, 1948.

It has been reported that construction of the heavy cruiser Northampton, of the 13,700-ton "Oregon City" class, has been resumed, although she, together with five of her sisters, had previously been cancelled. She is to be completed as a "Task Force Command Ship," with accommodation and equipment modified accordingly.

In the light cruiser class the Worcester was commissioned on June 26, 1948. She is the second ship of the "Roanoke" class, and although officially described as a "light cruiser," displaces 14,700 tons. Details of her armour are not yet available, but she carries twelve 6-inch dual-purpose guns of a new automatic model, twelve 3-inch guns in twin mountings fitted with automatic radar control, and a large number of 40-mm. A.A. pieces. The Roanoke herself was completed at the end of 1948. It has been reported that work on the Newark, of the 10,000-ton "Fargo" class, has been resumed. The previous information on this ship was that her hull was to be used as a target for underwater attack.

DESTROYERS, SUBMARINES, ETC.

Chief interest in the U.S. destroyer programme is centred in the two prototype "hunter-killer" ships, specially designed to operate against fast submarines. No details have been issued, either as to size, speed, or armament, though from their cost it would seem that they are to be somewhere between a cruiser and a destroyer in size. Various tonnages have been mentioned, ranging from 3,500 to 7,000, but further details will have to be awaited before any idea of their final shape can be envisaged. One report describes them as a 4,000-ton cruiser with a hull form similar to the "San Diego" type of A.A. cruiser. The first is to be called Norfolk. In addition, the prototype of a 3,650-ton destroyer is to be built.

Four destroyers of a new design were included in the 1947-48 programme. Again no details have yet been announced except that they are to be fitted with new facilities for anti-submarine warfare. A report that four new destroyers are to be named after Admirals Lee, McCain, Wilkinson, and Mitscher, all of whom served in the last war and are now deceased, may refer to these four boats.

Building has been suspended on the destroyers Castle, Woodrow Thompson, Lansdale, Seymour Owens, Hoel, Abner Read, and Seaman,

and the Timmerman is now being completed to a new design incorporating an experimental power-plant installation. Work has also been suspended on the two destroyer escorts Vandivier and Wagner.

A considerable amount of work has been carried out on the U.S. submarine fleet, mainly in the conversion of older boats to carry modern fittings and also their stream-lining for higher submerged speed. It is expected that this stream-lining, coupled with the installation of more powerful batteries and electric motors, will raise the submerged speed of the older boats to 17 or 18 knots. Some 60 or more have been fitted with the Schnorkel device, and some of the 2,200-ton class have been taken in hand for alteration to troop-carrying submarines, cargo carriers, etc. The Perch was the first to be fitted for the carrying of troops and has accommodation for 160 men above her normal crew.

New construction in the fiscal year 1948 was limited to four boats, Tang, Trigger, Trout, and Wahoo, at the Portsmouth Naval Shipyard, New Hampshire. They are of what are known as "fast attack type," of approximately 2,200 tons, and are to be fitted with engines of the German Walther type, expected to give underwater speeds of up to 25 knots.

During 1948 the submarines Requin and Spinax were fitted as radar picket vessels, joined later by the Tigrone, taken out of reserve and commissioned after conversion on November 9. The duties of these vessels include the keeping of a permanent radar watch during war-time for enemy aircraft, etc. Submarines so fitted, it has been stated, can penetrate farther into the Arctic than any surface craft and so keep radar watch on the northern routes across the polar regions.

Another new development in an old boat is the conversion of the Cusk as a vessel firing guided missiles. Presumably these are of the V.1 type, with which a considerable volume of experiment has been carried out during the last two years. A trial launching of a V.1 was successfully carried out from a submarine during this year.

The two older boats Halibut and Skate have been removed from the effective list.

The fiscal year 1949 sees an addition of nine further submarines of an improved and larger patrol type, but details are lacking. The prototype is also being built of a new small submarine designed for special duty, said to be of an anti-submarine nature.

There has again been extensive scrapping of surplus warships in the minor categories, 886 vessels of all kinds being disposed of during the year, to make a grand total of 7,320 since July 1, 1944. There now remain 105 vessels available for disposal. The sale to foreign navies of redundant vessels was also continued during 1948, but the programme has now been completed and the United States Navy Vessel Disposal office has been disbanded.

Work has been continued on LST 1154, a prototype landing ship of advanced design, and also on the Bryce Canyon, a destroyer tender. Both these ships should soon be in commission. A number of fleet destroyers are being modified for A/S warfare and also as fast destroyer escorts.

NAVAL AVIATION

Congress has approved a naval air programme entailing the provision of 14,500 aircraft of all types as recommended by the Congressional Aviation

Policy Board. The Navy is expected to bring its air arm to full strength by July 1, 1949, by withdrawing aircraft from storage until new machines are delivered. The whole programme of replacement will be completed by 1954.

The replacement of the old torpedo and dive-bomber aircraft, the TBM and SB2C, with the heavier and faster single-seater AD and AM models, is proceeding as rapidly as new planes are delivered. By June 1948, nine of the thirty squadrons based on carriers had been re-equipped with the new machines. Two Navy and one Marine fighter squadrons had also been equipped with jet fighters by that date.

A large volume of experimental work has been carried out in the anti-submarine field, and special aircraft have been developed to increase the scouting range of the fleet. Considerable advance has also been made in aircraft electronics, especially in the sphere of ground-controlled approach systems, so that all-weather flying is within sight of becoming an established fact. This system has also been tested on board a carrier, with results which prove its feasibility for use with the fleet.

During the year 1948, 911 Navy and Marine pilots successfully completed their flight training course. In the same period 291 officers and 11,797 men completed ground and specialist courses.

The Navy still retains 85 airships, of which eight are in service with the fleets as combat craft and fourteen are allotted to shore establishments, mainly for training and research. The U.S. Navy still retains its belief in the efficiency of these craft in some aspects of anti-submarine warfare.

Research in aircraft structures has tended to concentrate on new materials for construction which will stand up to the greatly increased pressures experienced as the sonic barrier is reached and pierced. New materials tried include a metal and wood "sandwich," plastics, and new light alloys. A good deal of progress has been made in the use of titanium and magnesium base alloys, heat-resistant and impact-resistant finishes, and non-inflammable hydraulic fluids. Research has also proceeded in the fields of aerodynamics and hydrodynamics in order to improve performance, flying qualities, and hydrodynamic characteristics. This research has been carried out mainly in wind tunnels and towing basins, and also in flight with full-scale and model aircraft.

As in Great Britain, considerable attention has been paid in the United States to the development of new power plants for aircraft. Although most research is concentrated on jet engines, a new reciprocating engine has been designed by the Navy and an order placed with the Wright Aeronautical Corporation for its initial production. It is known as the "Turbo-Cyclone 18" and combines features of the conventional reciprocating engine with three velocity turbines driven by the engine exhaust gases. The saving in fuel consumption is claimed to give the aircraft 20 per cent. greater range. Further research has been given to the turbo-jet engines, ram and pulse jets, liquid rocket engines, and fuel.

In an attempt to solve the problem of the icing of the new jet engines, a turbo-jet powered plane was anchored on the top of Mount Washington in New Hampshire and the engine run in high winds and icing conditions. Any results obtained have not yet been made public. Intensive research is also being undertaken on the problem of armouring jet engines, and the

possibility of using composite materials in place of face-hardened armour is being investigated.

New tactics, brought about by higher speeds and improved performance, have been studied and tried out during the past year, especially in possible attack courses, manœuvres, firing ranges, lead angles, tracking rates, and ammunition requirements. In anticipation of aircraft reaching speeds where manual control of a plane is no longer possible, considerable thought has been devoted to possible methods of introducing automatic means of control by instrument and a good deal of progress made. Another new development during 1948 was an automatic landing system, utilising the angle of attack as a control parameter. This has been under test throughout the year and has given good hopes of ultimate use on a large scale.

A new jet, swept-wing fighter successfully passed its initial test flights at Patuxent River Naval Air Test Centre in Maryland. It is the Chance-Vought XF7U-1 twin-jet plane, a tailless flying wing of new design. It is credited with a remarkably high rate of climb and a speed of well over 600 m.p.h. It has no landing flaps, and the necessary low speed for deck landings is achieved by slats on the leading edge and speed brakes on the trailing edge of the wings. It is powered by Westinghouse turbo-jet engines and its weight is kept down by substituting magnesium for aluminium. It is known as the "Cutlass."

In August 1947 the Naval jet aircraft D.558, "Skystreak," set up new world speed records during two periods of flying, with speeds of 640.7 and 650.6 miles per hour.

FRANCE

The battleship *Jean Bart*, due to complete in the first half of 1949, differs slightly from the *Richelieu*, mainly in a modified A.A. armament. She carries eight 15-inch, nine 6-inch, 24 3.9-inch, 28 57-mm., and a number of smaller A.A. weapons.

H.M.S. *Colossus*, a light fleet aircraft carrier, has been lent to France by Great Britain until 1951 and has been named *Arromanches*. France also has the *Dixmude*, ex-H.M.S. *Biter*. A light fleet carrier of 16,700 tons, to carry 42 aircraft, has been laid down, but has so far not been given a name.

The ships taken over by France from the Italian Navy are the cruisers *Attilio Regolo*, *Pompeo Magno*, and *Scipione Africano*, the destroyers *Legionario*, *Mitragliere*, *Velite*, and *Alfredo Oriani*, the sloop *Eritrea*, two submarines, two oil tankers, of which one was the *Tarvisio*, and 32 other vessels of small size. The *Pompeo Magno* is reported in a poor state of repair and will probably be dismantled to make spares for the other two cruisers. The *Regolo* has been renamed *Chateaufort*, the *Scipio* becomes the *Guichen*, and the four destroyers have been given the names of *Duchaffault*, *Jurien de la Gravière*, *Duperré*, and *D'Estaing*. The *Eritrea* is renamed *Francis-Garnier*, and the *Tarvisio* is now the *Garonne*.

A floating dock and 21 ex-German craft, including three T-type destroyers, have been ceded to France by the United States out of her share of the surrendered German Navy. In addition to the destroyers there are 12 minesweepers, one aviation supply ship, one aviation repair and maintenance ship, one depot ship, one oiler, and other smaller craft such as trawlers, ocean-going tugs, torpedo recovery vessels, etc.

Four ex-American frigates, the Laplace, Le Brix, Leverrier, and Mermoz have been adapted as weather ships for the North Atlantic Meteorological Survey. Seven corvettes, on loan from Great Britain, have now been returned.

RUSSIA

The return of the British battleship Royal Sovereign has been balanced by the receipt of the Italian battleship Giulio Cesare. The pocket battleship Lützow, ex-Deutschland, has been refloated at Swinemunde, where she was sunk in shallow water, and is undergoing an extensive refit for conversion into a sea-going gunnery training ship for the Baltic Fleet. Her six 11-inch guns are being changed to similar sized guns of Russian calibre.

The two new cruisers being built in Russian yards are to be named Kalinin and Kaganovich and should be now completed. The cruiser Murmansk, ex-U.S.S. Milwaukee, has been returned to the United States, Russia receiving in her place the Italian Emanuele Filiberto Duca d'Aosta, for which it is to be hoped she will find a more convenient name. The two big German cruisers Seydlitz and Lützow, which fell into Russian hands at Königsberg (now Kaliningrad) in April, 1945, have been renamed Poltava and Petropavlovsk respectively. They are being re-armed with Russian guns and carry ten 7.1-inch in four turrets, "A," and "Y" turrets being triple. The ex-German cruiser Nürnberg has been renamed Makarov.

The three destroyers Zharki, ex-H.M.S. Brighton, Dostoini, ex-H.M.S. St. Albans, and Zhivuchi, ex-H.M.S. Richmond, have been returned. Italian destroyers received are Artigliere, Fuciliere, and Riboty. Three torpedo boats, Fortunale, Animoso, Ardimentoso, two submarines, Marea and Nicheleo, and 36 other small craft comprise the rest of the booty taken over from Italy. From Japan the Russians received six destroyers, Haratsuki, Hatsuzakura, Hibiki, Kaya, Kiri, and Shii, and numerous smaller vessels. It has been reported that the Italian-built destroyer Tashkent, sunk during the war at Novorossisk, has been salvaged.

It is, however, in submarines that the Russian Navy is particularly strong. Propaganda broadcasts over a year ago gave the figure of 250 operational boats, and this number has been accepted as generally correct. Most of the Russian naval shipbuilding resources have been devoted to an intensive programme of submarine construction and large numbers of 250-ton boats have been constructed at Nikolaiev, some distance up the River Bug. All these boats are reported to have the Schnorkel breathing tube fitted. A number of partially completed German U-boats were seized in German ports during the final advance to Berlin in 1945 and have no doubt now been completed. It has also been reported that the U-boat assembly yards and engine manufacturing plants at Peenemünde have been dismantled and shipped to Russia and that some 4,000 submarine technicians and construction supervisors sent to the U.S.S.R. A number of the new boats are fitted with German Walther engines to give a high submerged speed.

It has also been reported that large numbers of midget submarines of the German "Seehund" type are being built at Kronstadt, Odessa, and Nikolaiev. They are manned by two men, carry two torpedoes, and are said to have a cruising range of 60 miles.

ITALY

Vice-Admiral Emilio Ferreri succeeded Rear-Admiral Francesco Mangeri as Chief of Naval Staff during 1948.

The two modern battleships *Italia* and *Vittorio Veneto* are being broken up at Spezia.

An addition to the list of ships which Italy is allowed to retain under the peace treaty is the corvette *Calabrone*, making twenty corvettes in all.

OTHER EUROPEAN COUNTRIES

BELGIUM

The frigate *Sheboygan* has been purchased from the United States and renamed *Lieutenant ter Zee V. Billet*, after a gallant Belgian naval officer who lost his life in the raid on Dieppe on August 19, 1942. She is of 1,430 tons, with a speed of 20 knots and is armed with three 3-inch and four 40-mm. guns and four depth-charge throwers.

The *Breydel*, formerly the pre-war sloop *Zinnia*, has been completely rebuilt and lengthened by 30 feet. She now has one funnel and a tripod mast.

Eight British motor minesweepers have been lent to the Belgian Navy to assist in mine clearance in coastal waters. In addition the boom defence vessel *Barcock* has been chartered.

DENMARK

The two small destroyers *Huitfeldt* and *Willemoes* were completed in 1948. They were laid down in 1939 in the Royal Dockyard in Copenhagen and work on them deliberately slowed down during the years of German occupation. They are of 710 tons and are armed with two 3.5-inch and four 20-mm. guns and six torpedo tubes. Their designed speed is 35 knots. Two ex-German torpedo boats, the *T.4* of 800 tons and *T.19* of 600 tons, were acquired from the United States. Both are capable of 33 knots. Of the six torpedo boats of 329 tons building in Denmark, the *Krieger*, *Bille*, *Buhl*, and *Krabbe*, have been completed and the *Hohn* and *Hammer* are approaching completion.

Five ex-German motor torpedo boats are being reconstructed for service in the Royal Danish Navy and 22 ex-German *Raumboote* have been working under the Danish flag for mine clearance. A minesweeper, *KFK 260*, was mined and lost off Frederikshavn. From Great Britain Denmark has purchased three of the small 540-ton V-class submarines; *P.52*, which served during the war under the Polish flag as the *Dzik*; *Vortex*, lent to the Free French Navy and renamed by them *Morse*; and *Vulpine*.

EIRE

Eire has signalled her emergence as a Republic by launching out into a small navy. She acquired three corvettes from Great Britain, the *Macha*, ex-H.M.S. *Bellwort*, the *Maev*, ex-H.M.S. *Borage*, and the *Clona*, ex-H.M.S. *Oxlip*. Commanding Officer of the Eireann Navy is Commander H. J. A. S. Jerome, D.S.O.

FINLAND

Finland has lost her largest warship, ceded to Russia under the terms of the peace treaty signed between the two countries. She is the 3,900-ton coast-defence vessel *Vainamoinen*. She mounted four 10-inch guns in two turrets.

GREECE

The old cruiser *Averof* has been replaced in the Royal Hellenic Navy by the *Eugenio di Savoia*, received from Italy. She is of 7,789 tons displacement, mounting eight 6-inch and eight 3.9-inch guns, and a designed speed of 36 knots. Greece has also acquired a corvette from Canada, ex-H.M.C.S. *Petrolia*, and two landing ships (dock) from the United States, ex-Eastway and Oceanway.

Five fleet minesweepers of the "Auk" class were turned over to Greece after completing their service in the British Navy under lend-lease. These are the *Constant*, *Florizel*, *Gorgon*, *Jasper*, and *Steadfast*, each of 890 tons standard displacement. The "Auk" class had the reputation of being the best design of double-loop sweepers afloat.

NETHERLANDS

The naval estimates for 1949 proposed the construction of a second flotilla of six destroyers, to be completed in 1955, and four submarines, of which delivery is expected in 1954. It was also stated that the Netherlands will institute a ten-year building programme with the aim of providing three task forces, each consisting of one light fleet aircraft carrier, two A.A. cruisers, and eight destroyers, and in addition a reserve of one light fleet carrier, two cruisers, and twelve destroyers. This would appear an ambitious programme and rather beyond the capacity of so small a country as Holland.

H.M.S. *Venerable*, light fleet carrier, has been sold to Holland and takes her place in the Dutch fleet in lieu of the *Karel Doorman*, ex-H.M.S. *Nairana*, which was on loan to the Netherlands and has now been returned.

The new cruiser *Eendracht*, laid down in 1939, has had her name changed to *de Ruyter*. The two 8,350-ton cruisers laid down before the war are now completed and are being fitted as A.A. cruisers. H.M.S. *Garland*, a destroyer of 1,335 tons, manned during the last war by the Polish Navy, has been purchased by the Netherlands government. Other acquisitions are H.M.S. *Beachy Head*, a maintenance ship of 8,580 tons, renamed *Vulkaan*, and the *Thruster* (ex-L.S.T. 3520), renamed *Pelikaan*. She is being used as a fleet supply ship. It has also been reported that the Netherlands have purchased the *Nella* (ex-H.M.S. *Bruiser*), but for what purpose has not been announced.

Two more British submarines, *Taurus* and *Tapir*, have been sold to Holland and renamed *Dolfijn* and *Zeehond* respectively. They join the *Tijgerhaai* (ex-Tarn) and *Zwaardvisch* (ex-Talent) to make four submarines of this type now under the Dutch flag.

The majority of Dutch naval units are reported to be on service in the East Indies.



New Russian battleship of "Sojus" class, as she will appear when complete

International News Photo



U.S. amphibious manoeuvres in the Caribbean. A landing craft unloading; in background, an L.S.T. about to beach
U.S. Official Navy Photograph

NORWAY

H.M.S. Crown, a "C" class destroyer of 1,710 tons laid down as a flotilla leader in Scott's Yard at Greenock, has been acquired by Norway and re-named H.N.M.S. Oslo. Developing 40,000 s.h.p., she exceeded her designed speed of 34 knots on trial, and is armed with four 4.5-inch dual-purpose guns, six smaller A.A. pieces, and eight 21-inch torpedo tubes. Norway has also purchased the Philante, the pre-war motor yacht built for Mr. T. O. M. Sopwith and taken over by the Admiralty for service during the war, as a royal yacht for King Haakon. She has been renamed Norge.

Work has been started on the breaking up of the 45,000-ton German battleship Tirpitz, sunk in Tromsø Fjord by the R.A.F. in November, 1944.

POLAND

Under an arrangement with Russia, a number of Soviet ships have been transferred to Poland, though they are hardly sufficient to strengthen in any way Polish naval power. They include nine motor minesweepers of 130 tons, renamed Albatross, Cyapla, Jashkolla, Jastryah, Kani, Kondor, Koraiovon, Kroqulec, and Orlik; twelve "submarine chasers," a somewhat ambitious nomenclature for wooden motor launches of about 40 tons; and two motor torpedo boats.

PORTUGAL

Two frigates, ex-H.M. Ships Avon and Awe, have been acquired from Great Britain and six patrol vessels from the United States. Two more British trawlers, the Ruskholm, of the "Isles" class and the Saltarelo, of the "Dance" class, have been purchased to add to the previous four bought in 1945. The design of these boats has been found particularly suitable for Portuguese requirements. Two ex-Fairmile "B" class and six H.D.M.Ls. have been acquired for service in the Far East, and are stationed at Maçao to check smuggling and piracy.

The surveying vessel Dom Joao de Castro ran on a rock off the Cape Verde Islands and became a total loss. She was of 1,028 tons and built at Lisbon in 1940.

Portugal has acquired three submarines from Great Britain, the Saga, Spearhead, and Spur. They are named Nautilo, Neptuno, and Narval respectively.

SPAIN

Work has continued on the reconstruction and modernising of Spanish cruisers. The Galicia and Miguel de Cervantes have been completed and the l'Almirante Cervera should be back in commission this year. The Canarias has been taken in hand. The older Mendez Nuñez has also been modernised and is completed.

The Spanish submarine C.4 was rammed and sunk by the destroyer Lepanto, with the loss of her entire crew of 46 men, during manœuvres near the Balearic Islands. The Lepanto was badly damaged, but made port safely.

SWEDEN

The two new cruisers, *Tre Konor* and *Göta Lejon*, have been commissioned. They are of 7,400 tons displacement and carry an armament of seven 6-inch, twenty 40-mm, and nine 20-mm guns, and six 21-inch torpedo tubes. Their engines of 100,000 s.h.p. give them a speed of 33 knots.

The two new destroyers building, sister ships to the *Oland* and *Uppland*, are to be named *Halland* and *Smaland*. The *Uppland* has completed her trials. These boats are of 1,800 tons and are fitted with De Laval geared turbines developing 44,000 s.h.p. and giving a speed of 35 knots.

The following ships have been discarded from the Swedish fleet as being no longer of any value: the coast defence ironclads *Aran* and *Tapperheten*, both built in 1901, the destroyers *Psilander* and *Puke*, built in 1926 and purchased from Italy in 1940, the submarine *Gripen*, built in 1928, three depot ships and a number of smaller craft.

TURKEY

It has been reported that two cruisers of the "Baltimore" class are to be transferred to Turkey by the United States under the terms of the European Aid programme. Also included are four frigates, of which the names are not yet known, eight motor minesweepers of the "Y.M.S." series, a repair ship, a small oiler, ex-U.S.S. *Chiwaukam*, now re-named *Akpinar*, a petrol carrier, and a netlayer.

Eight fleet minesweepers have been acquired from Great Britain, the former H.M. Ships *Catherine*, *Chance*, *Elfreda*, *Frolic*, *Grecian*, *Pique*, *Tattoo*, and *Tourmaline*. They are all of 890 tons standard displacement.

The four United States submarines *Blueback*, *Boarfish*, *Brill*, and *Chubb*, recently acquired from America, have been renamed *Sakarya*, *Gür*, *Birinci İnönü*, and *Ikinci İnönü* respectively. They are all of the "Balao" type, launched in 1944.

YUGOSLAVIA

The Italian gunboat *Illiria* has been ceded to Yugoslavia under the terms of the peace treaty. The corvette ex-H.M.S. *Mallow* is believed to be still in Yugoslav service under the name of *Partizanska*.

Two 250-ton U-boats, built by Russia from German designs, have been received overland from *Nikolaiev*.

AMERICAN COUNTRIES

ARGENTINA

An important programme of new construction has been authorised, which is to include the construction or acquisition of an aircraft carrier, a cruiser, four destroyers, three submarines, ten patrol vessels, and one supply ship.

Four disarmed frigates have been purchased for the Argentine Navy. They are the former U.S.S. *Asheville*, *Reading*, and *Uniontown*, and ex-H.M.S. *Caicos*, a former lend-lease vessel. They have been renamed *Hercules*, *Hermina*, *Saraudi*, and *Trinidad*. Also acquired is the former

seaplane carrier Albatross, built in 1926 for the Royal Australian Navy but transferred to the Royal Navy in 1928.

The coast defence vessel Belgrano is no longer effective.

BRAZIL

Admiral Sylvio de Noronha has been appointed Minister of Marine and Vice-Admiral Adalberto Lara de Almeida is now Chief of Naval Staff.

It has been reported that the United States cruisers Nashville and Phoenix have been transferred to the Brazilian Navy. Also acquired have been three U.S. Navy tugs of the "A.T.A." type, of 835 tons, and with diesel-electric engines of 1,500 h.p. to give a speed of 13 knots. They have been named Tridente, Tritão, and Triunfo.

The sail training ship Albert Leo Schlagter, one of the German prizes allotted to the United States, has been sold to Brazil and renamed Guanabara. She is a steel barque of 1,634 tons displacement and with a sail area of 21,530 square feet. She has auxiliary engines of 700 b.h.p., M.A.N. diesels, giving a speed of 10 knots. That Brazil has a strong belief in sail training is evidenced by this purchase, as she now has two such vessels, the other being the Almirante Saldanha, a four-masted schooner of 3,325 tons and a sail area of 25,990 square feet. Auxiliary diesels of 1,400 b.h.p. give her a speed of 12 knots. She was built by Vickers-Armstrongs in 1933.

CHILE

The United States cruiser Boise has been acquired by the Chilean Navy. In addition to the three frigates and three corvettes purchased in 1947, the Chilean Government has bought from the United States two transports, ex-U.S. Ships Xenia and Zenobia, renamed President Errazuriz and Presidente Pinto respectively. They are vessels of 5,800 tons with a speed of 16.5 knots. In addition, the 21,500-ton fleet oiler Pecos has been purchased, and also fourteen landing craft.

Negotiations for the purchase from this country of H.M.S. Ajax were finally broken off during 1949 and the ship is now to be scrapped.

COLOMBIA

A frigate, now named the Almirante Padilla, has been purchased from the United States. It is not known whether this is of the "River" or "Crown Colony" class.

CUBA

Among a number of ships acquired from the United States are the frigates Antonio Maceo, ex-Grand Island, José Martí, ex-Eugene, and Maximo Gomez, ex-Peoria, and the escort vessels Caribe, ex-P.C.E 872, and Siboney, ex-P.C.E 831. Five or six submarine-chasers have also been acquired.

DOMINICAN REPUBLIC

The Dominican Republic has taken advantage of the disposal of surplus warships by the major belligerent powers to provide herself with a Navy. It now consists of two destroyers, four frigates, five corvettes, three patrol vessels, twelve coastal craft, two landing craft, three rescue launches, and six tenders.

The destroyers are the *Generalissimo*, ex-H.M.S. *Fame*, and the *Trujillo*, ex-H.M.S. *Hotspur*. The frigates are ex-H.M.C.S. *Carlton Place* and ex-U.S. Ships *Natchez*, *Knoxville*, and *Pueblo*, the two latter being now known as *President Peynardo* and *Presidente Troncoso*. The corvettes are the former Canadian *Lachute*, now called *Colon*, and the Canadian *Belleville*, *Louisburg*, *Peterborough*, and *Riviere Du Loup*. Another ship of this class, the *Asbestos*, was wrecked on the Cuban coast and, though salvaged, is reported too badly damaged for naval service.

ECUADOR

Two new frigates have been added to the Ecuadorian flag by purchase from the United States. They are the *Ecuador*, her former name not being reported, and the *Guayas*, formerly U.S.S. *Hoquiam*, of the modified "River" class. Also bought are the patrol yachts *Diez de Agosto*, ex-U.S.S. *Opal*, and *Nueve de Octubre*, ex-U.S.S. *Turquoise*.

MEXICO

Four of the modified "River" class frigates, discarded by the United States Navy, have been bought for service in Mexican waters. They are vessels of 1,430 tons with a speed of 19 knots. Formerly named after distinguished Mexican generals, they were recently re-christened as *California*, *Papaloapan*, *Tehuantepec*, and *Usumacinta*.

Five submarine chasers of the "P.C.E." type have also been purchased and have been named *Blas Godinez*, *David Porter*, *Pedro Sainz de Baranda*, *Tomas Mariu*, and *Virgilio Uribe*. They are vessels of 795 tons, fitted with twin diesel engines and capable of a speed of 18 knots.

PERU

The U.S. cruiser *St. Louis* has been allotted by the United States to Peru.

Two Canadian frigates, the former H.M.C.S. *Poundmaker* and *St. Pierre*, have been purchased and added to the Peruvian fleet under the names of *Teniente Ferre* and *Teniente Palacios*. One of them replaces the old destroyer *Almirante Guise*, launched at Tallinn in 1915 and now no longer serviceable. More recently a third frigate, ex-U.S.S. *Woonsocket*, of the modified "River" class, was acquired.

OTHER COUNTRIES

CHINA

The chaotic conditions existing in China, with civil war raging between Communist and Nationalist forces, make it extremely difficult to obtain reliable information about the state of the Chinese Navy. A majority of the warships have been concentrated at Formosa, so far immune from the Communist advance, but some have deserted to the Communist cause and others have been overrun during the advance southward.

One of those which deserted was the cruiser *Chunking*, formerly H.M.S. *Aurora*. She, with a destroyer so far unidentified, deserted to the advancing forces. Later, she and the destroyer were heavily bombed by the Nationalist aircraft and the destroyer severely damaged, though the

cruiser was first said to have beaten off the attack with her A.A. guns. One report, however, says she was sunk, and a subsequent one by the Communists, denied by the U.S. Embassy in Nanking, that American planes were involved in the sinking, would seem to confirm the truth of this statement.

In addition to the *Aurora*, China acquired H.M.S. *Mendip*, a 1,000-ton destroyer of the earliest "Hunt" class, renaming her *Lin Fu*.

A total of 271 minor war vessels were transferred to China by the United States under President Truman's Aid to China Bill, passed by Congress. These include four destroyer escorts. Previously China had acquired two escort vessels, *Tai Kang*, ex-*Wyffels*, and *Tai Ping*, ex-*Decker*, two patrol vessels *Yung Sheng* and *Yung Shun*, ex-P.C.E 867 and ex-P.C.E 869, four fleet minesweepers *Yung Hsing*, *Yung Ning*, *Yung Tai*, and *Yung Ting*, ex- *Logic*, *Lucid*, *Magnet*, and *Mainstay*, and the oiler *Omei*, ex-*Maumee*. Other additions were seven L.S.Ts., five L.S.Ms., four L.C.Is., and three L.C.Ts.

Of the 92 Japanese destroyers and smaller craft still afloat and seaworthy at the surrender, China received 23. They include the former Japanese destroyers *Hatsugume*, *Kaede*, *Naminaze*, *Sugi*, *Tsuta*, *Yoizuki*, and *Yukikaze*. She also received from Japan the ex-Italian gunboat *Lepanto*, now renamed *Yen Ning*.

The two smaller cruisers of 2,500 tons, *Ning Hai* and *Ping Hai*, are now no longer in existence, though their fate is as yet unknown.

Five Canadian "Castle" class corvettes, of 1,060 tons with a speed of 16.5 knots, have been purchased. These are the former *Bowmanville*, *Coppercliff*, *Humberstone*, *Orangeville*, and *Tillsonburg*.

During 1948 a Chinese naval training centre was set up in Tsingtao under joint Chinese-U.S. naval administration.

EGYPT

The sloop *El Amir Farouq* was sunk off Gaza during October, 1948. The conditions in which she sank suggest an internal explosion. She was of 1,441 tons displacement, built in the United Kingdom in 1926.

Eight motor minesweepers of the American "Y.M.S" type, a Fairmile "B" type M.L., and twenty landing craft have been in service with the Egyptian Navy, presumably on loan.

Hitler's yacht *Grille* has been bought by the Egyptian Government for use by King Farouk, in place of the old yacht *Mahroussa*.

PHILIPPINE ISLANDS

The infant Filipino Navy began its existence last year with the acquisition of two U.S. coastguard cutters, *Orchid* and *Tulip*, for service as surveying vessels. Other purchases include L.S.T. 75 and two or three other small craft.

SIAM

The two modified "Flower" class corvettes, *Burnet* and *Betony*, and the fleet minesweeper *Minstrel*, of the "Algerine" class, have been purchased by the Siamese Navy.

P. K. KEMP

CHAPTER IV

Three-dimensional Naval Defence

AFTER CENTURIES in which the maintenance of an adequate Navy has been regarded as the first essential for the survival of England in war, speculation, criticism, and doubt are now being voiced in many quarters in regard to the respective importance of our three Fighting Services; the function of the Navy has become a popular target for old and young in both the Press and the lecture room. Many of the statements made on these matters are both wild and uninformed, but they are often readily grasped by a public which is still much more mindful of the personal impact with which the German Air Force assaulted them than of that with which German submarines and German surface raiders threatened their existence. It therefore seems vitally important for authentic statements on the subject to be brought to public notice so that a dangerous unbalance of our Forces will not be brought about by popular opinion and demand.

The swing of the pendulum is no less evident in America than in this country; and this is despite the very high level of efficient service given by the American Navy during the war and the just tribute paid to it by the whole American nation, who have realised that their entirely up-to-date and "three-dimensional" Fleet was all that stood between them and defeat. Nevertheless, this has not prevented a well-known and much-read American monthly periodical from publishing an article which begins:

"Most Americans now believe that an unchallengeable air force is their one best hope for peace, that it is more likely to deter the Russians than either a big Army or a massive Navy. . . . Why should they fear an American Navy? Russia is independent of the sea, has no naval or merchant fleet worth mentioning, and none of her vital industry is within range of naval weapons. . . ."

This argument is quoted as typical of many used also in this country, where, of course, the debt of the nation to its Navy is no less than it was in America. A second dictum, similar also in its form in the Press of both countries, expresses a like view:

"Against any possible enemy what role is there for a carrier-based air force?"

Such arguments may play a large part, if not a vital one, in the politics of national defence. They might appear to have an apt place alongside modern scientific developments. But what are the facts?

Supposing we were faced with a continental enemy, whose armed forces bore a general resemblance to those possessed by Hitler in 1939, could not a massive army throw itself forward, like Hitler's, towards the seaboard of Europe? Are the military obstacles to its progress likely to be, relatively, as formidable as those presented to the westward progress of the Reichswehr? Who believed that within a few months of beginning this drive Hitler would occupy practically the whole Atlantic coast of Europe, from which to operate his submarines and heavy ship raiders? Even before the western invasion, the war on shipping in every ocean had begun, by surface ships as well as U-boats, from bases lying within easy striking

distance of our whole bomber force! Moreover, it appears possible that in all arms except carriers (probably), our naval strength relative to that of a potential enemy may be even smaller than it was in 1939. In view of these considerations, how is it possible to justify the proposition that it is only in regard to air forces and the use of the atomic bomb that the strength of the Western Powers in Europe need be superior to that of any future aggressor?

In last year's review of the future requirements of the Forces (H.M. Government's "Statement relating to Defence, 1948," Cmd. 7327) the potentialities of new weapons were not overlooked; and, clearly bearing in mind the lessons of history and the geographical facts involved, the Government still do not seem prepared to trust too much to the speculations and hopes of the "scrap the Navy" school:

"With these considerations in mind," they say, "His Majesty's Government are determined to maintain balanced forces adequate to fulfil their responsibilities in peace and to serve as a nucleus of expansion in war."

Nor, evidently, is it their intention to rely yet upon any other navy for meeting the primary commitments of our own, which are described in unequivocal terms in the same Government paper, as follows:

"The Royal Navy, with its air arm, must be enabled to perform its vital role in the control of sea communications and to execute such tasks overseas as are laid upon it."

for the paper concludes:

"It remains the firm intention of His Majesty's Government to maintain the forces which are needed to support its international policy, to ensure the security of the United Kingdom, to maintain its interests throughout the world, and to enable it to play its full part in the preservation of world peace. . . ."

The general continuance of this policy is indicated again in the "White Paper on Defence" of the current year.

AN "AUSTERITY" NAVY

Evidence of a conflict of principle in the composition of the forces appears, however, even in the former quoted authentic document. In referring to new scientific developments whose effect "it is not yet possible to assess with any accuracy," emphasis is placed on the "need to preserve a flexible policy"; and a warning is given that "there must be no rigidity in decisions about the future role of the three Services." This danger-signal is emphasised by a further observation in the statement for 1948, which states:

"The share of the national resources which can be made available will inevitably be limited for some time to come by the need to restore the general economy of the country, on which everything else depends. In these circumstances, it will clearly be necessary to pursue a severely *selective policy* in order to concentrate our defence on essentials. . . ."

This must call our attention to the urgent need for a comprehensive and unprejudiced survey of priorities in defence. For, indeed, the claims of defence are that they shall be those most appropriate for the war conditions which are deemed probable from day to day, rather than those whose precise nature is still a matter of conjecture.

It is the interpretation of this *selective policy* which is determining the size and composition of the fleets of to-day and of to-morrow; and it is upon it, also, that hang the future roles which are to be assigned to naval aviation. In theory at least the primary role of the Navy remains, as shown above, the control of sea communications; its other *overseas tasks* may be a matter of speculation, but World War II provided many important examples of the diverse forms which they may well take. They include naval cover for swift military assault across great distances of ocean, the provision of air support and intensive gun attack at points outside the practical and economical range of shore-based air forces, and the provision of elusive temporary bases* for powerful air-bombing attacks against similarly placed enemy targets. The use of carriers in the late war was practical and justified by results, even when the enemy were able to make use of the most powerful and modern local air defences.

In the interception and destruction of enemy naval surface forces and in the persistent attack of enemy lines of communication, under most conditions of weather, time, and geography (including even the narrow waters of the Mediterranean), the special advantages of a fleet over shore-based forces—its mobility, endurance, and ability to remain for long periods in a given area in all weathers—have invariably been demonstrated. A very recent example of this was in the important inter-service exercise which took place in the autumn of 1948, when the fleet, whose approximate movements were well advertised, could not be found by the "defending" air force during the whole of the former's relatively slow approach to the English Channel from the West Indies. Other examples of graver consequence took place during the war.

For the protection of trade against every form of attack in three-dimensional space, be it by surface raider and warship, by submarine, or by aircraft, experience in the late war also proved the great practical superiority of naval over land-based air forces. This conclusion applied as much to the results obtained by land-based air forces in their attack on bases, building-yards, and sources of supply as in their operations against submarines and surface warships at sea. For example, the greatest proportion of U-boats lost by the enemy was that destroyed by naval convoy escorts. Throughout all the operations of the kinds described above, aircraft carriers took an increasingly important part as the war progressed; at its conclusion their importance had become paramount not merely to a fleet but to the defence forces as a whole.

Many lessons of the war have now been digested, and among them are to be found two of general importance concerning the use of carriers, which have been matters both of surprise to the optimistic and of comfort even to the pessimistic among students of naval warfare. The first is the ability with which relatively small numbers of carrier fighter aircraft could protect ships at sea from enemy bomber attack; the second, its corollary, the comparative immunity with which properly trained and organised carrier forces could approach a strongly held enemy coast. These, coupled with its unique capacity for striking powerful blows outside the range of gunfire, by torpedo, rocket, and bomb, and the inherent

* Recent United States naval policy included the construction of immense aircraft carriers of 65,000 tons for the operation of bombers of the size of B.29, and at a cost of some 127 million dollars apiece.

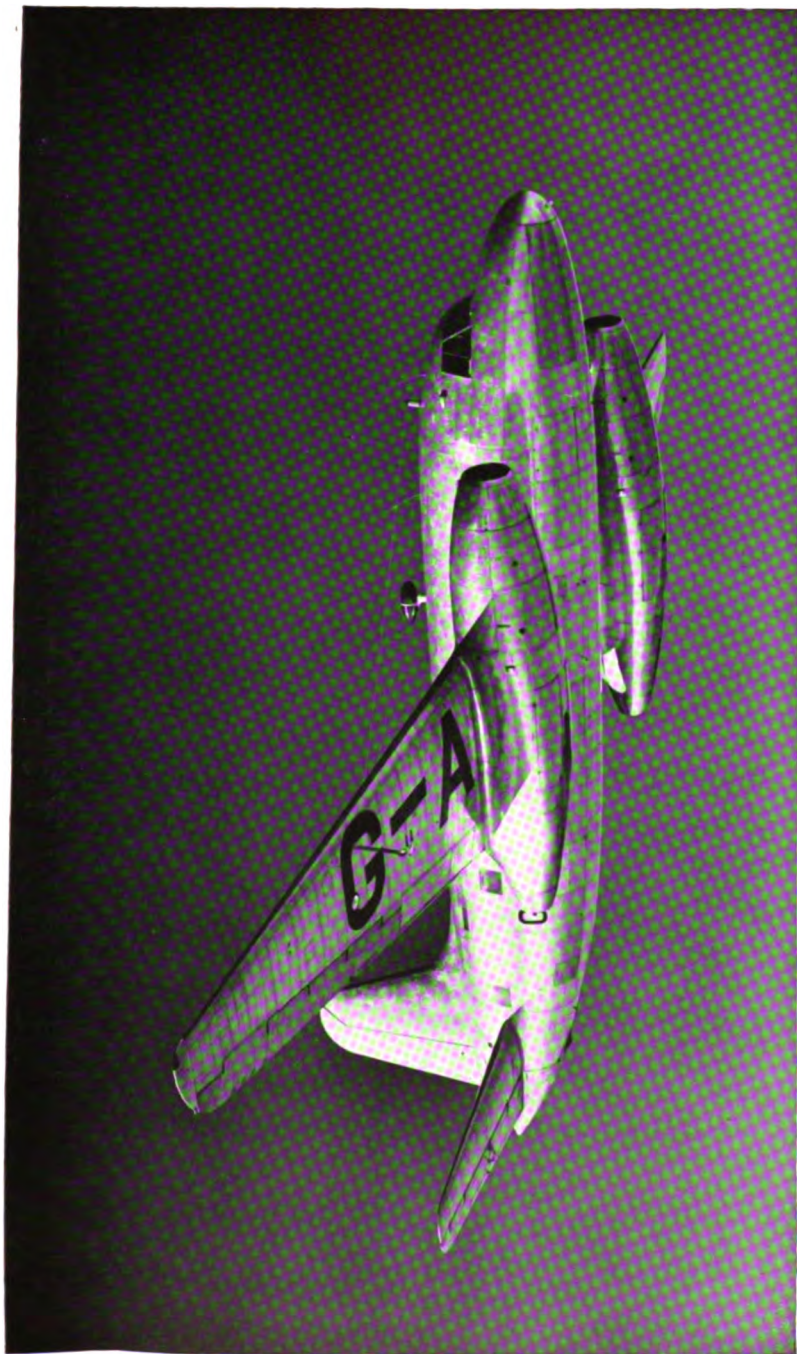


U.S. amphibious manoeuvres in the Caribbean. The first flight landing with fighter support

U.S. Official Navy Photograph



British naval aircraft—Firebrand V
Courtesy of Messrs. Blackburn Aircraft, Ltd.



Viking with Rolls-Royce "Nene" jet engines
Courtesy of Messrs. Vickers-Armstrongs



U.S. amphibious manoeuvres in the Caribbean. Rocket bombardment before landing
U.S. Official Navy Photograph

ability of warships of all kinds to achieve a rapid and high degree of concentration at any desired point, the carrier has now been realised to possess qualities which have raised it to the most important place in the composition of a fleet.

TASK FORCES AND TRADE PROTECTION UNITS IN THE POST-WAR FLEET

Thanks to the urgent need that there was for economy of material, personnel, and effort during even the more lavish periods of the war, a new pattern for the optimum composition of a fleet was worked out with true battle conditions as a background. The task force organisation has now permanently replaced the old-time system of battle fleets, cruiser squadrons, destroyer flotillas, and the like, as the operational units.

Under the new system the task force is generally built round its carrier component, the other units being provided for the purpose of giving the carrier local security; but the composition of the task force varies somewhat with the locality in which it is to be employed. Within such units may be found relatively heavy ships, which can be more suitably armed than aircraft carriers for combat against any enemy surface ships or attacking craft that can elude the protective patrols and approach within dangerous missile range of the carriers themselves. Heavy ships may, on the other hand, be needed for providing direct bombardment of an enemy coastal position; with aircraft direction of fire, this is usually a more tactically economical proceeding than attack by bombing.

In the diverse fields of trade protection as well as in the attack on trade, ship-borne aircraft must also play a very large part. For it is the naval aircraft which has forced the submarine to remain below the surface in very wide areas of sea for long periods and has thus greatly restricted its opportunities for and modes of attack; and it will be upon the naval aircraft that even more dependence than ever will have to be placed for locating the permanently submerged submarine of to-day in the wider areas of search now inevitably involved. During World War II extensive use was made of naval aircraft in the search for and shadowing of surface raiders, and for both this and anti-submarine work the small amphibians operated by catapult from cruisers and other ocean escort ships played an important part and covered convoys on the many ocean routes where aircraft carriers were not available and which lay outside the relatively limited operating zones of shore-based air units. Hardly less important than that of anti-submarine duty was the role played by naval fighters in the protection of trade in areas, such as the Mediterranean, Bay of Biscay, and off the Norwegian coast, against enemy air attack. Such tasks can be expected to recur.

NOTE.—The words “naval aircraft” have been used rather generally here to refer to all those aircraft which undertake war duties in the protection of sea communications.

FUTURE ROLES OF NAVAL AIRCRAFT

When, indeed, we contemplate the calls upon the Navy in the event of a future war, we will have to visualise conditions of danger to our sea communications of much the same kind and often of as serious a nature

as that which obtained in World War II. At the outset we should be prepared for an initially serious attack on Atlantic shipping by submarines of the latest types (continuously submerging) and sporadic air attacks on shipping in the North Sea. Airborne minelaying by the enemy in many important shipping waters would also appear to be possible.

On land, advances by enemy armies would seem to be almost inevitable in the early stages. We should be prepared for them to gain access to naval and air bases on the Mediterranean seaboard (Adriatic, Greece, and Italy), as well as in Western Europe, and the threat to shipping both in harbour and at sea would be correspondingly increased. The introduction of convoy and the provision of strong air, as well as surface, naval escorts could not be long delayed, perhaps as far afield as the Indian Ocean. The possibility of surface raider attacks is hard to assess, and their success would probably depend upon the enemy obtaining a degree of German technical experience in carrying them out. They could hardly, however, be entirely ruled out.

OFFENSIVE OPERATIONS

The duty falling upon the Navy would, in addition to its task of trade protection, be to provide aircraft carriers for taking the earliest opportunities to strike heavy blows at enemy land bases. Every hundred miles that an aircraft carrier can take an air striking force nearer to its object before it is launched on its mission is a vital gain in load-carrying capacity for the aircraft. This gain may be used for an increase of its bomb load, for greater engine power and higher performance, for carrying better navigating equipment, or for increasing its defensive armament. Further valuable advantages are conferred when carriers are used in this way. A higher degree of surprise may be achieved than is possible for land-based bombers, which have to use well-known approach routes; a greater immunity from interception from the out-going bomber force, and a greater effect when the target area is reached, may also be achieved through the enemy enjoying little warning. Moreover, the operating base, being highly mobile, also enjoys a measure of security of its own from both observation and attack.

The carrier task force can have yet another important role to fulfil, namely that in which it is used for extending the range of *military* operations. Our recent war experience has taught that, given well-balanced naval task forces, in which a generous margin of fighter carriers is included, large land forces can safely be moved over wide ocean distances with the prospect of successful deployment in the face of opposition on arrival. Without an adequate carrier element present, such expeditions are unthinkable.

PERSONNEL

These fundamental changes in the general composition of our Fleet are, not unnaturally, having profound reactions on the occupations and careers of the personnel. How could it be otherwise when the main backbone of the Fleet changes in less than ten years from some fifteen battle-ships and battle cruisers, supported by only four active carriers, whose role was ancillary to the main fleet's operations, to the present almost precise

reversal in proportions and basic roles of these classes of ship respectively? Most noticeable, of course, of the changes affecting officers and men is the exchange from gunnery to aviation as the principal field of specialisation in the new Navy. Less noticeable but equally revolutionary is the enormous increase during the last ten years in the number of personnel concerned with radio and other electronic equipment—a result very largely due to the scientific measures introduced into the Fleet both for operating the Navy's aircraft more effectively and for combating those of the enemy.

The implications of these changes and their effect on manning are, of course, widespread. Whereas in 1938 two Flag Officers only held air appointments, notably the Fifth Sea Lord and the Rear-Admiral Aircraft Carriers, now there are no less than six (four ashore and two afloat) and a Rear-Admiral (E.) (in charge of reserve aircraft); and these are needed even with the present very reduced Fleet. So important a factor in naval operations has aviation now become that, by a recent decision, no longer will the Home Fleet Commander-in-Chief fly his flag in a battleship as Fleet Flag Ship, but in a fleet carrier, our most recently completed—H.M.S. Implacable.

The number of naval personnel now concerned with air duties and aircraft maintenance amounts to about one-fifth of the whole Navy. To-day aviation as a specialist career for a young executive officer should offer chances of good service and promotion second to none. Yet so conservative, it seems, are the traditions of the Royal Navy, that the advantages of taking this specialisation are still not fully recognised; the old branches of gunnery, torpedo, navigation, and signals still apparently claim more volunteers among young officers wishing to specialise. It would appear, indeed, that there must be some lack of conviction still in the minds of many that aviation does, in fact, offer a good career. Some naval officers still serving have been following this branch of the profession regularly since 1924—many of those joining the original pilot and observer courses have reached the age of flag rank; a few indeed have actually achieved it. Do young officers not see in this proportion a reasonable number still holding responsible posts; or is there some other reason for their lack of interest in this branch? The answer is not obvious, but those who are hesitating would do well to study the facts and reflect on the inevitable trend of naval development to-day.

A NEW SHORT-SERVICE SCHEME FOR OFFICER PILOTS AND OBSERVERS

Whatever the reasons may be, recruiting for naval pilot under the pre-1949 arrangements, in both officer and naval airman categories, seems to have fallen far short of requirements; in this, the Royal Air Force seems to have fared no better. At the same time, there is a great increase in the complexity of aircraft controls, instruments, radio, and other operational equipment. This has led both the Navy and the Royal Air Force to abandon their earlier wish to reduce the number of officers in air-crew duties, and so maintain a proportion of officers and men nearer than formerly to that of other combatant branches of the services. These facts, together with the new need to provide for a reserve of more experienced

personnel so that the demands of expansion in time of war may be met, have led the Admiralty to introduce a new short-service scheme—not dissimilar to that introduced to meet the initial requirements for the Fleet Air Arm when it came under naval control as a result of the Cabinet decision of July, 1937.

Under the new scheme, details of which are given in a recent Admiralty Fleet Order, officers will be entered for flying duties as pilot *or* observer four times a year (January, April, July, and October) for a period of eight years' active service, followed by seven years on the Emergency List with liability for service in time of war or emergency. They will join as Cadets and be rated Midshipman after six months' service. Three months' pre-flight training will precede the standard basic and applied courses in flying (twelve months for pilot and nine months for observer). Then will follow operational flying courses. After one year and four months as Midshipmen, officers will normally be promoted to Acting Sub-Lieutenant.

The notable features of this scheme, which differentiate it from that of 1938, are that :

- (i) These officers will not belong to a separate branch of the Service, as did the (A) branch; and
- (ii) The Fleet Order states that there will be opportunities for a certain number to transfer to permanent commission in the R.N.

The Order also states that National Service ratings, merely because they are naval ratings, are not debarred from seeking short-service commissions as pilots or observers if they fulfil the necessary conditions.

THE R.N.V.R. AIR SQUADRONS

Great progress has been made in the establishment of this air reserve. The first four squadrons have been formed and are in operation at Naval Air Stations as follows :

1830	Abbotsinch	(Firefly—Fighter Reconnaissance)
1831	Stretton	(Seafire 17)
1832	Culham	(Seafire 46 and 17)
1833	Bramcote	(Seafire 17)

Each squadron also possesses Harvard trainers; training appropriate to their war-time duties is in full swing at all of these stations and the keenness and efficiency of the squadrons have already been amply demonstrated at the recent air exercises in the south of England (February 23, 1949), in which they attacked the Royal Naval Air Station at Culham.

AIRCRAFT CARRIERS

During the past twelve months only one new aircraft carrier has left British yards—the light fleet carrier *Terrible*, which, after completion and preliminary trials, was transferred to the Royal Australian Navy and re-named *Sydney*. Carrier Air Group No. 20, composed of Nos. 805 (*Sea Fury*) and 816 (*Firefly*) Squadrons, are to be embarked when the ship proceeds to her own home station early this year.

The names of other carriers under construction, already announced, are as follows :

<i>Fleet Carriers</i>	Ark Royal	Built at Cammell Laird, Birkenhead.
	Eagle	Built at Harland & Wolff, Belfast.
	(Their length is given as 803 feet and armament 16 4.5-inch guns—no aviation details.)	
<i>Light Fleet Carriers</i>	Majestic	Built at Vickers, Barrow.
	(Terrible belonged to this programme.)	
	(Length 695 feet—no aviation details.)	
	Albion	Built at Swan Hunter, Tyne.
	Centaur	Built at Harland & Wolff, Belfast.
	Bulwark	Built at Harland & Wolff, Belfast.
	One other (Hermes) Built at Vickers, Barrow. Not yet launched.	
	(Length 736 feet—no aviation details.)	

Two items of special technical interest in carrier development have been made known this year. H.M.S. Vengeance is at the time of writing engaged in cold-weather trials in company with other ships. The war provided many occasions when H.M. ships were obliged to operate in conditions of extreme cold; experience showed that not only were the arrangements for personnel not always suitable for such conditions, but sometimes the equipment could not be normally operated. Hence these ships have been sent to Arctic waters for a few weeks to test and gain experience in the use of modern naval equipment of all kinds. Some experience indeed will already have been gained in the damage done to the carrier by impact with ice, but unfortunately much of the time so far spent there has provided conditions not widely differing either in weather or in temperature from those obtaining in home waters at the present moment!

FLEXIBLE DECKS

The second technical development of particular note is an innovation in the operation of aircraft from carriers, the news of which has only recently been released. This is the provision of a new type of landing deck which will enable aircraft to land on a carrier without the use of an under-carriage, and with which trials are now proceeding in the light carrier Warrior with a Vampire aircraft.

Some reference was made on these pages last year to the possibility that carrier-borne aircraft of the fighter type would benefit by certain developments in their operation from carriers by actually raising their performance as interceptor fighters above that now possible with airfield-operated types; the use of catapult launching and rocket-assisted take-off were obviously early steps in that direction. The use of this new type of deck, which allows the recovery of piloted aircraft constructed without the encumbrance of an under-carriage, is obviously an even more important contribution to the attainment of high performance. The perfection of this development may, indeed, lead to large strides forward in the design not only of interceptor, long range, and escort fighters, but also of strike aircraft, and so even further enhance the importance of aircraft carriers in the armoury of national defence.

NEW NAVAL AIRCRAFT

At the presentation of the Naval Estimates this year, the First Lord of the Admiralty referred to the present period as one in which the replacement of obsolete types of aircraft, and a general consolidation of the organisation remaining after the post-war releases and reductions, have had precedence over any large expansion in numbers. Experience with new types and technical developments are, under our restricted post-war conditions, necessarily slow.

Progress is nevertheless being made in the trials of many new types, including jet aircraft, and also in the gradual re-equipment of the front-line squadrons. The standard types visible in the Fleet are still, however, the Firefly (1, 4, and 5), Seafire 17 and 47, Sea Fury 11, Sea Hornet 20, and Firebrand 5. But it is expected that Attacker, Wyvern, and Hawker N7 squadrons will soon be a common sight on the decks of our fully operational carriers.

A highly satisfactory demonstration of new types of naval aircraft was given in August last year in New York, when a squadron of naval aircraft comprising Sea Hornets, Sea Furies, and a Sea Vampire took part in the International Air Exhibition there. They subsequently gave displays at the National Exhibition at Toronto.

CONCLUSION

European economic recovery is still far from being out of the wood, and so long as the economic stability of the western world remains an uncertain factor, so long, it seems, must the possibility of war be taken seriously. During the past twelve months, under this continued threat, statesmen have been compelled to review the possibility of organising mutual armed assistance. The keynote of this year's Defence Estimates has been the re-appearance of the idea of greater preparedness, and to use the First Lord's words in describing one of the principal directions of naval expenditure, it is "required to maintain and improve the state of readiness of the Fleet."

In the sphere of naval aviation, therefore, the normal peace problems of development and research, coupled with an emphasis on training rather than on a great front-line array, are now complicated by the problem of "immediate readiness"; the compromise—no new one—has once more to be faced as to the precise point at which research and progress have to give way to the continued production of weapons already tried, though obsolescent.

VOLAGE

CHAPTER V

The United States Defence Structure

THE DEFENCE organisation in the United States has undergone great changes since the end of the war in 1945; and indeed it may still be said, at the time of writing, to be in a state of flux, for in February, 1949, a Congressional Commission under the chairmanship of Mr. Herbert Hoover recommended substantial modifications in it. In its present form it derives from the National Security Act of 1947, which came into force on September 17, 1947, and brought into existence the National Military Establishment. The working of the organisation during the first fifteen months of its existence was described in the first report of the Secretary for Defence, the late Mr. James V. Forrestal, to the President for the year 1948.

Up to 1798 the defence forces of the United States were administered by the War Department; in that year the Department was split into the Departments of the Army and of the Navy, each under its own Secretary. The only organisational link between the two was the President himself, in his capacity as Commander-in-Chief of the Armed Forces. After 1912 both Services provided themselves with aircraft, regarding them, as they then were, merely as weapons applicable to any warlike operations, whether by land or sea. That, it may be said, is still their position and status as far as naval aviation is concerned; but by 1934 the Army Air Force had in effect reached the status—through the creation of the General Headquarters Air Force—of a separate Service, though still nominally a part of the Army and actually subject, to a large extent, to over-all control by the Army Staff. In 1941, however, by the administrative re-organisation of General Marshall, the Army Chief of Staff, it was elevated within the War Department to equality with the Army itself. The National Security Act of 1947 constituted it a separate Service, co-equal with the Army and Navy, as is the Royal Air Force in this country, and at the same time brought all three Services into one organisation under the Secretary of Defence.

That organisation is entitled the National Military Establishment, and it comprises:

The War Council	}	All under the Office of the Defence Secretary.
The Joint Chiefs of Staff		
The Joint Staff		
The Munitions Board		
The Research and Development Board	}	Each administering its own Service.
The Department of the Army		
The Department of the Navy		
The Department of the Air Force		

Its activities are co-ordinated with the other departments of Government involved in the preparation for or conduct of war operations through the National Security Council, over which the President himself presides, into the organisation of which it is not necessary to enter further here.

THE SECRETARY OF DEFENCE

The Secretary of Defence is the principal assistant to the President in all matters relating to national security, and is specifically charged with the duties of:

(a) Laying down general policies, and programmes, for the National Military Establishment as a whole, and also for each of the departments and agencies which are comprised in it;

(b) Exercising general "direction, authority, and control" over those departments and agencies.

(c) Eliminating all unnecessary duplication or overlapping of their functions or actions, in all fields of their activity.

(d) Supervising and co-ordinating the budgets of the Services, both in the sphere of Estimates and also—which is not, as it is in this country, the same thing—of programmes undertaken in accordance with appropriations.

The various bodies which comprise the national military organisation, as set out above, may be described in detail as follows.

THE WAR COUNCIL

The War Council consists of the Secretary of Defence as Chairman, the Secretaries of the Army, Navy, and Air Force, the Chief of Staff, Army, the Chief of Naval Operations, and the Chief of Staff, Air Force. Its function is to advise the Secretary of Defence on broad matters of policy concerning the Armed Forces. It seems rather an anomaly that the Secretary himself should be a member of a body set up to advise him, but of this subject more hereafter.

THE JOINT CHIEFS OF STAFF

This body is the analogue of the Chiefs of Staff Committee in this country, and indeed may well have been modelled on the form the latter assumed during the course of the late war. Its members are the Chief of Staff to the Commander-in-Chief (the President), the Chief of Staff of the Army, the Chief of Naval Operations, and the Chief of Staff of the Air Force. The Joint Chiefs of Staff, in their corporate capacity, are described as the "Principal Military Advisers to the President and to the Secretary of Defence," and their duties are defined as:

(a) Strategic planning for and direction of military forces.

(b) Joint logistic plans and assignment of logistic responsibilities to Services thereunder.

(c) Establishing necessary unified commands in strategic areas.

(d) Formulating joint training policies.

(e) Formulating and co-ordinating education policy for the Services.

(f) Reviewing major military material and personnel requirements under strategic and logistic plans.

(g) Providing U.S. Representative on the Military Staff Committee of United Nations.

Under the Joint Chiefs of Staff there is a Joint Staff, which works on the above duties; it is not to exceed 100 officers in all, who are to be drawn in approximately equal numbers from the three Services.



American Carrier U.S.S. Coral Sea
U.S. Official Navy Photograph



U.S. amphibious manoeuvres in the Caribbean. Preliminary bombardment by U.S.S. Missouri

U.S. Official Navy Photograph

THE MUNITIONS BOARD

This is composed of the Assistant Secretary, or Under Secretary, from each of the Departments of the Army, Navy, and Air Force. Its function is to translate the strategic and logistic plans of the Joint Chiefs of Staff into administrative action in the sphere of providing material. It determines priorities within the "procurement" programmes of the Services, co-ordinates those programmes with each other and with industrial resources, and generally acts as the co-ordinating authority in the sphere of munition production and supply.

THE RESEARCH AND DEVELOPMENT BOARD

This Board consists of a Chairman nominated by the President and two representatives from each of the three Services, designated by the Secretaries of the Departments—it is not stated whether they are necessarily to be officers of the Services, as they have been hitherto, or whether it is open to a Secretary to nominate a man of science. The function of the Board is defined as being to advise the Secretary of Defence on the status of scientific research regarding national security (rather an obscure statement!) and to assure adequate provision for research and development on scientific problems affecting national security. Its duties are further defined in detail as:

- (a) To prepare an integrated military research and development programme.
- (b) Advise on scientific research trends re national security, and steps to ensure constant progress.
- (c) Recommend research and development co-ordination among the the Services, and allocate responsibility for specific joint programmes.
- (d) Formulate National Military Establishment policy on research and development matters outside the Establishment.
- (e) Examine interaction of research and development and strategy, and advise the Joint Chiefs of Staff thereon.

THE SERVICE DEPARTMENTS

The Departments of the Army and of the Navy were, of course, in existence before the passing of the National Security Act of 1947, and their functions and powers, and those of the Secretaries of the Army and Navy who presided over them, were prescribed and regulated by a number of statutes enacted from time to time during the century and a half of their existence. The Secretaries, for instance, had direct access to the President on a host of subjects and occasions, and had direct responsibilities in connection with many matters of administration in which the Services came into contact with other public authorities or with industry, which were assigned by statutes passed at various times. Not all such statutes were specifically either repealed or over-ridden by the National Security Act, while they were, of course, still binding on the Secretaries; the result was, therefore, that in some cases the Secretary of Defence, though enjoined to eliminate all overlapping and duplication between Departments under him, found in practice that he had not the power to do so. Of this subject

more below, in connection with the further modifications which have been urged from different quarters.

The Department of the Air Force, on the other hand, was only brought into existence by the National Security Act, and the Defence Secretary's powers in respect of it are therefore presumably not hampered in the same way. The Departments, however, are autonomous in all matters of administration—or at least were supposed to be. Since this chapter was begun, however, an incident has occurred which seems to indicate that the powers of the Secretary of Defence are greater than was supposed. It has been reported that he has directed the Secretary of the Navy to cancel the order for the latest and largest aircraft carrier, which was placed only a few months ago, and of which an enthusiastic description had been made public by the Navy Department. His direction was presumably complied with, but it was immediately followed by the resignation of the Secretary of the Navy. This sequence of events seems to indicate a difference of opinion between the Services, or between the Defence Secretary and the naval authorities, as to the measures to be adopted by the Navy in order to carry out the responsibilities assigned to it; and the resignation of the Secretary of the Navy may well indicate an unwillingness to assume those responsibilities if overruled. It would be unwise, however, to draw these conclusions definitely without full knowledge of the events and arguments that preceded them.

It is common knowledge, however, that there was a certain lack of full collaboration between Army and Navy in the years before December 1941—the various reports of the many investigations into the Pearl Harbour attack revealed that fairly explicitly. Moreover, although great efforts were at once made to remedy that lack from that time onwards, a certain aloofness that had persisted for generations would not be eliminated by a mere stroke of the pen, and it produced a time-lag in results which was unfortunate. It has been stated, for instance, that on every island in the Pacific which was taken into use as an operational, or transport base in the course of the campaigns that ended in 1945 in victory over Japan, there were constructed two entirely independent air stations, one for the Army and one for the Navy, each with a complete organisation and installation which duplicated the other. Piers, harbour installations, maintenance organisations, post offices, hospitals, and welfare facilities, were all duplicated in the same way, and there was practically no collaboration between the two organisations which were providing identical services and facilities for the two fighting Services.

My authority for this somewhat damning statement is Mr. W. B. Huie, a journalist and war correspondent who is frankly an enthusiastic propagandist for the omnipotence of the air arm in every sort of warlike operation, who sincerely believes that it could do every warlike task better and cheaper than either Army or Navy, and who smarts under the repression at the hands of both generals and admirals that has been the lot of air enthusiasts of the school of General "Billy" Mitchell and himself in the years that are past. He has found an outlet for much accumulated venom in a book entitled "The Case against the Admirals"—whom, it seems, he regards as an even greater danger to the State than generals—in which these facts are set forth. Though many—amongst whom the present writer is to be numbered—will not share his strategical and tactical

beliefs or his somewhat biased interpretation of the opposition which has in the past hampered the drastic innovations urged by the air enthusiasts of whom he is typical, yet there is no reason to disbelieve his account of contemporary facts. According to that account it would actually seem that the progress towards full collaboration has been slower in certain provinces between Army and Navy of the United States than between both those admirable Services and their opposite numbers in our own country in the late war. There is evidently much for the newly created Secretary of Defence to do in the direction of "eliminating all unnecessary duplication and overlapping."

This is frankly admitted by Mr. Forrestal in his Report for 1948, to which reference has already been made :

"The mere passage of the National Security Act," he says, "did not mean the accomplishment of its objectives overnight. The most difficult part of the task of unification is to bring conflicting ideas into harmony. It is not strange that professional military men should think in the terms of the Service to which they have devoted their entire adult lives ; it is to be expected. But unification calls for the cultivation of a broader vision. . . . In the task of unifying and integrating Army, Navy, and Air Force I have been working with men in the three Services, both military and civilian, whose patriotism is beyond question and who are animated fundamentally by the same motive. . . . We have had many arguments and disagreements, because while all agree on the end result, there have been profound differences as to the methods of attaining that result. These differences are being resolved."

He goes on a little later to specify more clearly some, at least, of the grounds of disagreement :

"It is out of the competition inherent in the division of the total funds allocated to the National Military Establishment that the controversies arise. Many officers in the Air Force honestly believe that the carrier will have a limited use in any war that we may fight in the future, and therefore challenge the maintenance of the important carrier task forces. These misgivings are honestly held, as undoubtedly are the Navy's regarding the capabilities of the long-range bomber. My own view is that the concept of the strategic air force has established itself as an essential part of modern warfare, although I also believe that the Air Force must see to it that its tactical air remains capable of close co-operation with ground troops. I likewise hold the view that carriers and naval air will have a part to play in any war of the foreseeable future. The time may come when both the carrier and the long-range bomber are obsolete weapons, but that time has not yet arrived. . . .

"Summing up : I believe the Air Force, in its long-range strategic bombers, has a weapon which will play a very great part in any future conflict, but that it has its limitations and should not be relied upon as the sole striking force to the exclusion of the Army and Navy. I also believe that the naval air arm should be preserved as an integral part of the Navy, but that its development should be in terms of its own mission, which is distinctly not a competitive one with the strategic Air Force. Working together in close understanding and harmony with the Air Force, the air arm of the Navy can be a powerful adjunct of our total air striking power."

Later on, the Secretary presents a summarised report of the year's progress which indicates a sober satisfaction in what has been already accomplished and a sober confidence in the soundness of the lines on which it is proceeding, and in its steady continuance :

"This Office is now able to report that the state of the National Military Establishment is sound ; that the policies and functions of the departments and agencies concerned with national security are being integrated and co-ordinated ; that the unification of the Army, Navy, and Air Force into an effective combat team is

proceeding as rapidly as could be reasonably expected; that all three Services are in a better position to perform their missions than they were before the National Security Act became law; and that this Nation, therefore, is able to a greater extent to implement its policies, if need should arise, with military power. There will, however, be a continuing challenge to attain the complete integration and unification contemplated by the Act."

The detailed reports of the activities of each Service during the period covered describe a number of exercises in amphibious and joint operations that were carried out in localities as far apart as the Caribbean and Alaska.

SUGGESTED MODIFICATIONS

Despite the Secretary's satisfaction with the working of the new organisation and with both the progress already made and the prospect of further satisfactory progress towards the goal of "complete integration and unification," he has, not unnaturally, a number of changes in the organisation to recommend. They are, as will have been gathered from the foregoing remarks, chiefly in the direction of clarifying and strengthening the authority and powers of the Secretary, so as to put him in a better position to achieve the goal, against the conservative forces which, inevitably, he is likely to encounter in the early period of the existence of the new organisation. He asks for an Under Secretary, as an *alter ego* to himself, who will exercise his authority in his temporary or emergency absence. He asks for the elimination of the word "general" which qualifies his assigned "direction, authority, and control" over the departments and agencies that make up the National Military Establishment. He proposes to remove from the Joint Chiefs of Staff the Chief of Staff to the Commander-in-Chief, and to provide for a responsible head of that body. The latter, in Mr. Forrestal's view, should be either one of the three Chiefs of Staff—as in the Chiefs of Staff Committee in this country—or a fourth person designated by the President and the Secretary. He would have the limitation of the numbers of the Joint Staff removed. And, finally, he would remove from the National Security Council the three Secretaries of the Army, Navy, and Air Force, leaving the Secretary of Defence the sole representative thereon of the National Military Establishment. This last recommendation is easily understood; for if the three Secretaries who are supposed to be subordinate to him are co-equal members of the superior body, the National Security Council, the possibility exists of his being overruled, or at least out-voted, by his own subordinates.

THE HOOVER COMMISSION

In July, 1947 a statutory Commission was appointed to examine the organisation of the Executive Branch of the Government, under the chairmanship of Mr. Herbert Hoover. This Commission appointed a Committee—amongst others—presided over by Mr. F. Eberstadt to examine the working of the National Military Organisation. The Committee presented its report to the Hoover Commission in November, 1948; and the Commission, adopting it in great part in its own report to the President of the Senate and the Speaker of the House, published both early in 1949. The Eberstadt Committee endorsed Mr. Forrestal's

recommendations for changes in the organisation, as well as his satisfaction, in general, with the working of the National Security Act:

"Our present system, created by the National Security Act of 1947, is a long step forward. . . . The United States is unquestionably far better prepared to deal with the complex problems of foreign and military policy, mobilisation, and national defence than ever before in time of peace."

But it then proceeded to examine its working in detail, and to note certain defects, before passing to the suggestions for improving the system.

In the first place, the Committee found that there was a lack of liaison between foreign and defence policies. The military were planning how to fight the next war—if that tragedy should occur—without knowing exactly what the United States would be fighting for:

"National security is still thought of too much in terms of military strength alone. There is still inadequate recognition of the equal, and possibly even greater contributions to our national security that can and should be made by our political, economic, human, and spiritual resources."

They then decided that there were weaknesses in the Intelligence organisation, and that there was a lack of centralised authority which they regarded as indispensable to efficiency. On the latter point, they recommended that the authority in the military establishment should be placed firmly in the Secretary of Defence, in accordance with the traditional American principle of the supremacy of civilian control.

Their next criticism was that they found a lack in the military establishment of "cost consciousness," with the result that military expenditure tended to be over-lavish. The rising cost of all supplies and the "awful cost of reasonable safety" in the conditions of to-day demanded reform in this province. The budgetary system needed overhaul and a closer control at all levels, and better liaison must be established with the progress of scientific research in order to ensure against a wasteful use of resources in the sphere of weapon provision, and in that of making provision against new and unconventional methods of warfare which might be produced in the future.

It is interesting to note that, in their quest for means of improving teamwork and inter-Service collaboration, the Committee considered and rejected:

- (a) A single military chief of staff and general staff over all three military services.
- (b) Merger of the three military departments into a single department.
- (c) Merger of the Naval Air Arm with the Air Force.

It will be a matter for satisfaction in this country that it thereby endorsed the soundness of the similar decisions reached in this country in the same provinces—though there are, of course, and probably always will be, die-hards on both sides of the Atlantic who feel so strongly on these and such-like projects that they will continue to urge that through their adoption alone can salvation be achieved!

The Committee then proceed to make their recommendations in detail, starting with a *caveat* against any conclusion that, because they recommend modifications, they do not note and appreciate the good that has already been accomplished and the substantial progress made in many directions.

They would remove the offending word "general" which qualifies the authority given to the Secretary of Defence over the Departments, and they would create the office of Under Secretary which he desires; they would also abolish the offices of Under Secretary in the three Service Departments, limiting them to one Secretary each and two Assistant Secretaries. They would provide the Secretary of Defence with a "principal military assistant, or chief staff officer."

This last recommendation is an extremely interesting proposal. The Chief Staff Officer to the Secretary should be junior in rank to the regular members of the Joint Chiefs of Staff.

"He should sit with the Joint Chiefs of Staff, but without membership, and be responsible, in the Secretary's absence, for presenting and interpreting the Secretary's point of view, and for bringing 'split decisions' of the Joint Chiefs of Staff to the attention of the Secretary of Defence for resolution. . . . He should not be authorised to make military decisions on his own responsibility, to exercise military command, or to set up a military staff of his own."

A number of detailed recommendations are made to tighten control over the budget and to improve co-ordination. These proposals affect Congressional organisation as well as that of the National Military Establishment.

The longest part of the Committee's recommendation relate to the improvement of team-work and co-ordination between the Services. Liason should not be only at the top, where the Services and the Munitions Board or the Research and Development Board meet only in the National Security Council. It should be encouraged and improved at all working levels. They too would eliminate the Army, Navy, and Air Force Secretaries from the National Security Council, leaving the Secretary for Defence the sole representative of the Services there. They make proposals for the improvement of the War Council by adding the proposed Under Secretary for Defence and the heads of the Munitions and the Research and Development Boards to its membership. Finally they make a number of recommendations for investigation into the possibility of joint training for officers at some stage in their career, and for facilitating the exchange of officers between the Services.

It is interesting—and somewhat gratifying to this country—to find that the form of defence organisation evolved in America, as the result of war experience, follow so closely that which has been evolved, slightly earlier, in this country. It is all the more gratifying to learn that modifications since recommended as a result of early experience of the working of the new organisation should, broadly speaking, be more in the direction of assimilating American practice to our own than of moving away from it. There can seldom have been so close a liaison between Allies as was achieved between British and United States Forces during the late war, largely through the personality and wisdom of General Eisenhower. May that collaboration continue on the same level, and lead the world to happier and more tranquil times than those through which we have been living these last few years.

H. G. THURSFIELD

CHAPTER VI

Naval Marine Engineering Progress *1937-1949*

THE LAST review of naval engineering progress to appear in "Brassey's Naval Annual" was published in 1937. At that time most European countries had embarked on a re-armament programme, and the future policy for technical development and machinery production for their warships had been decided. In the United States it was possible to defer this decision, and the United States Navy was thus able to benefit by several years intense research without interruption from an enemy.

In Great Britain the period 1939-1945, as in the First World War, was marked by its intense production not only of machinery for new ships but also for the repair and replacement of the machinery that had suffered damage from enemy action. This production took priority over new development work, though there was one noteworthy exception to this in the production of a light-weight plant for the steam gunboats (S.G.Bs.), the machinery being designed and produced in a period of fifteen months following July, 1940. These gunboats were planned to counter E-boats operating in the Channel and a marine steam plant was produced with less than half the weight per shaft horsepower of existing practice. The necessity for continuing research and development in war-time was, however, more readily appreciated during 1939-1945 than during 1914-1918, and many of the new naval engineering developments that have been made public during the last few years were initiated under the stress of war.

Since 1937 there has been a general improvement in all forms of marine power plant. The only new form of propulsion for surface vessels has been a gas turbine unit, and the first naval unit of its kind was installed in the motor gunboat M.G.B. 2009. Development work on this project was commenced in 1942.

STEAM CONDITIONS

There are two major considerations facing the designer of naval machinery: firstly, the demand for an improved overall efficiency of the marine propulsion plant to give the fighting ship a greater endurance for a given weight of fuel, and, secondly, the desirability of reducing the weight and space of the plant to enable a greater amount of stores to be carried, or improved armament and protection to be fitted.

In the last ten years there has been rapid progress towards higher steam pressures and temperatures. The theoretical advantage of higher steam conditions has long been appreciated by naval designers, but the lack of suitable materials, inadequate research, sometimes the reluctance or inability of the marine industry to manufacture to a new technique, and the shortage of adequate boiler and engine testing facilities have been some of the major retarding influences.

By 1939 the Royal Navy had adopted steam conditions of 400 lb./sq. in. and 700° F. for large ships, while destroyers were still using 300 lb./sq. in. and 650° F., giving a fuel consumption of about 0.81 lb./s.h.p./hr. At this time the United States Navy had adopted 600 lb./sq. in. and 825° F. for their latest destroyers, with a very much lower fuel consumption. The Germans were using 1,100 lb./sq. in. and 930° F., but this machinery required more space than its British counterpart and was less economical.

Towards the end of the Second World War new designs of British destroyers had machinery with 650 lb./sq. in. and 850° F., and the disadvantage under which the country had suffered for many years of not having an adequate engine-testing establishment had been recognised by the setting up of the Parsons and Marine Engineering Turbine Research and Development Association ("Pametrada") at Wallsend in 1944, where full-scale trials of high-powered marine sets can now be carried out.

BOILERS

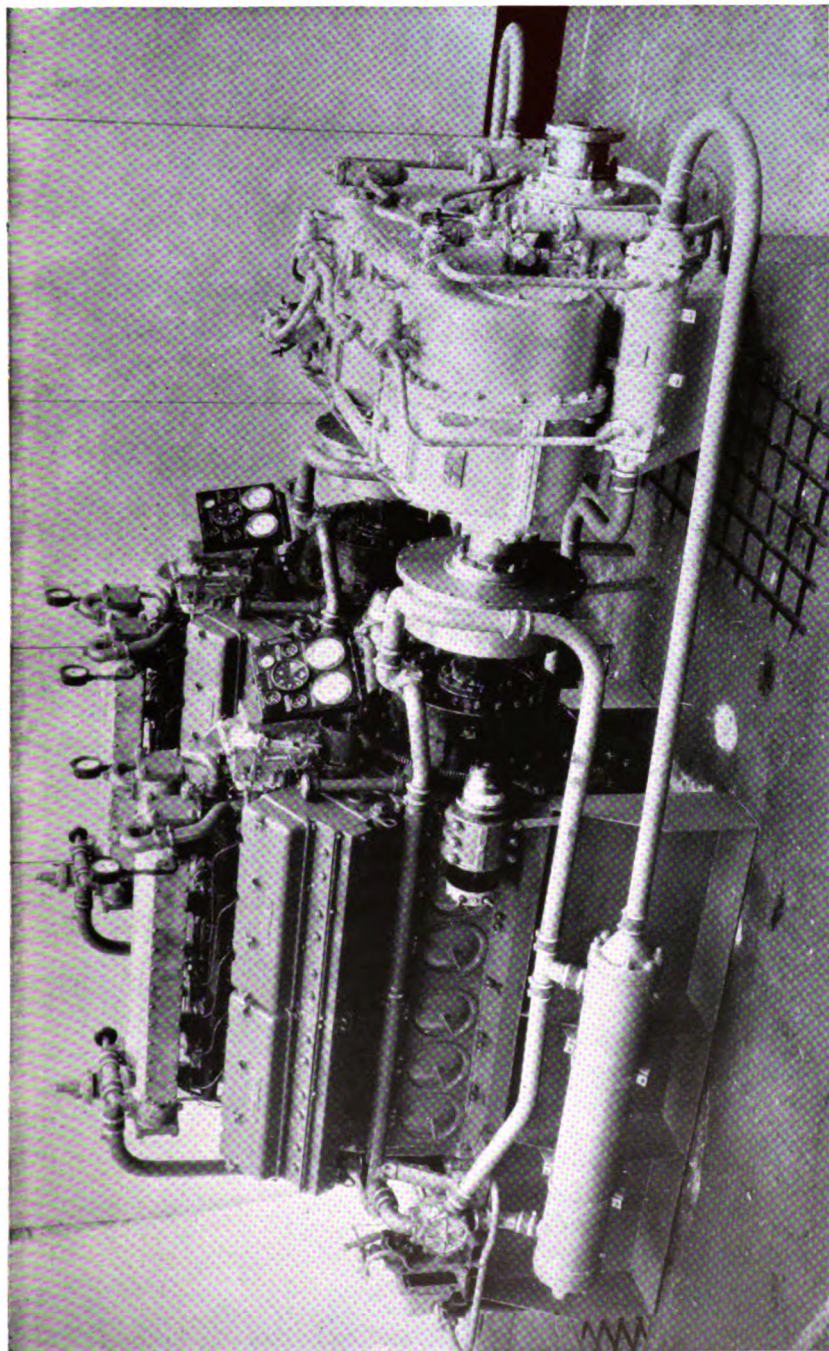
To assist boiler development the Royal Navy has at its disposal the Admiralty Fuel Experimental Stations (A.F.E.S.) at Haslar, where full-scale trials of boilers are possible. The duration of the trials is unfortunately limited by the tide, and during the Second World War an Admiralty test house was erected at Clydebank where a number of the latest boilers have been tested. It is the Admiralty's intention to erect a new boiler-testing establishment on the Tyne.

At the beginning of the Second World War the Admiralty three-drum boiler with superheaters fitted either between the 4th and 5th or 5th and 6th rows of the tube nest was the standard boiler fitted in H.M. ships. Improvements to this boiler in recent years include the deepening of the tube nest from 17 to 20 or 21 rows, the change in tube bore from 1½ inches to 1¾ inches for fire-row tubes and 1⅞ inches to 1 inch for the tubes outside the superheater, increasing the steam-drum diameter, the adoption of feed augmentors to improve the circulation, the adoption of external downcomers to ensure circulation at the higher forcing rates, improving the feed supply inside the steam drum, and the use of welded or forged drums instead of riveted drums.

The Admiralty carried out trials with a number of different designs of boiler to compare them with the standard Admiralty three-drum boiler with superheaters. These trials showed that the Admiralty boiler compared very favourably with all except the controlled superheat two-furnace boiler, which has a better superheat characteristic, and this type has been adopted for the latest destroyer designs. Economisers are also being fitted in the latest designs.

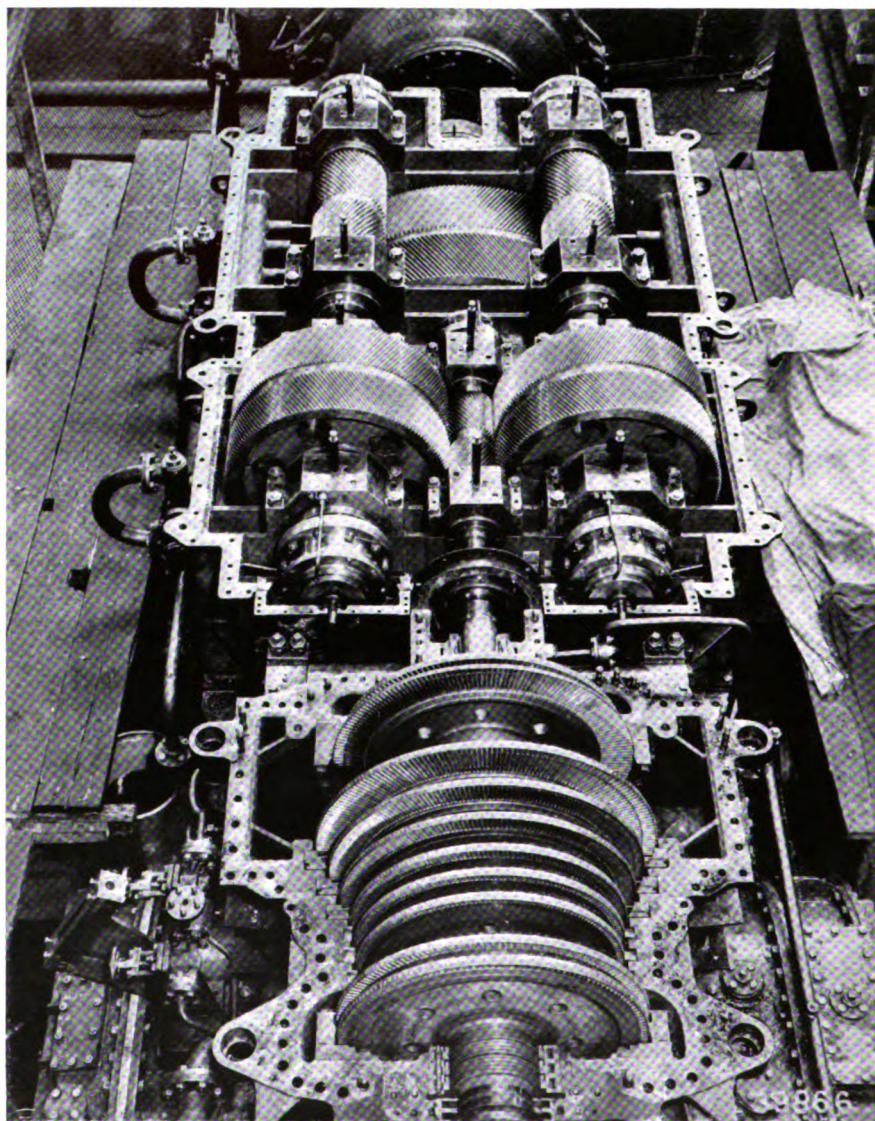
In 1937 air preheaters were a standard fitting in cruisers and the larger British warships, and with them came a change to the "closed front" boiler. New improvements in fuel-oil burning arrangements have originated from Haslar; in fact, ever since Chief Inspector of Machinery James Melrose patented the first satisfactory pressure-spray system, A.F.E.S. has steadily improved upon it.

Trials of the forced circulation boiler for naval purposes have been carried out by most naval Powers. The Germans fitted a number of these boilers of the La Mont and Benson type, but reverted later to the



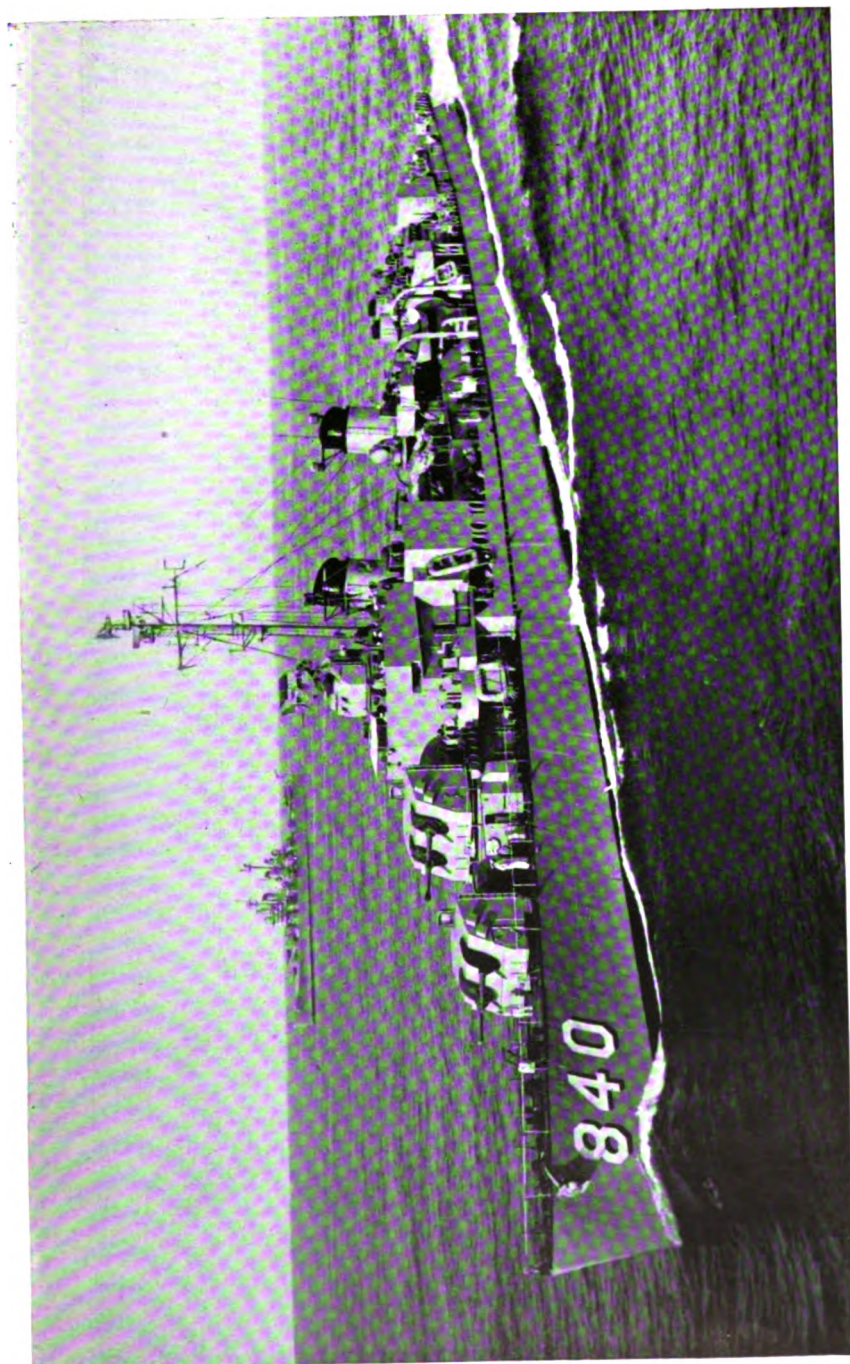
L.C.T. propelling machinery—A pair of Paxman 12 T.P. engines geared to the same shaft through oil-operated reverse gears

Courtesy of Davey, Paxman and Co. Ltd.

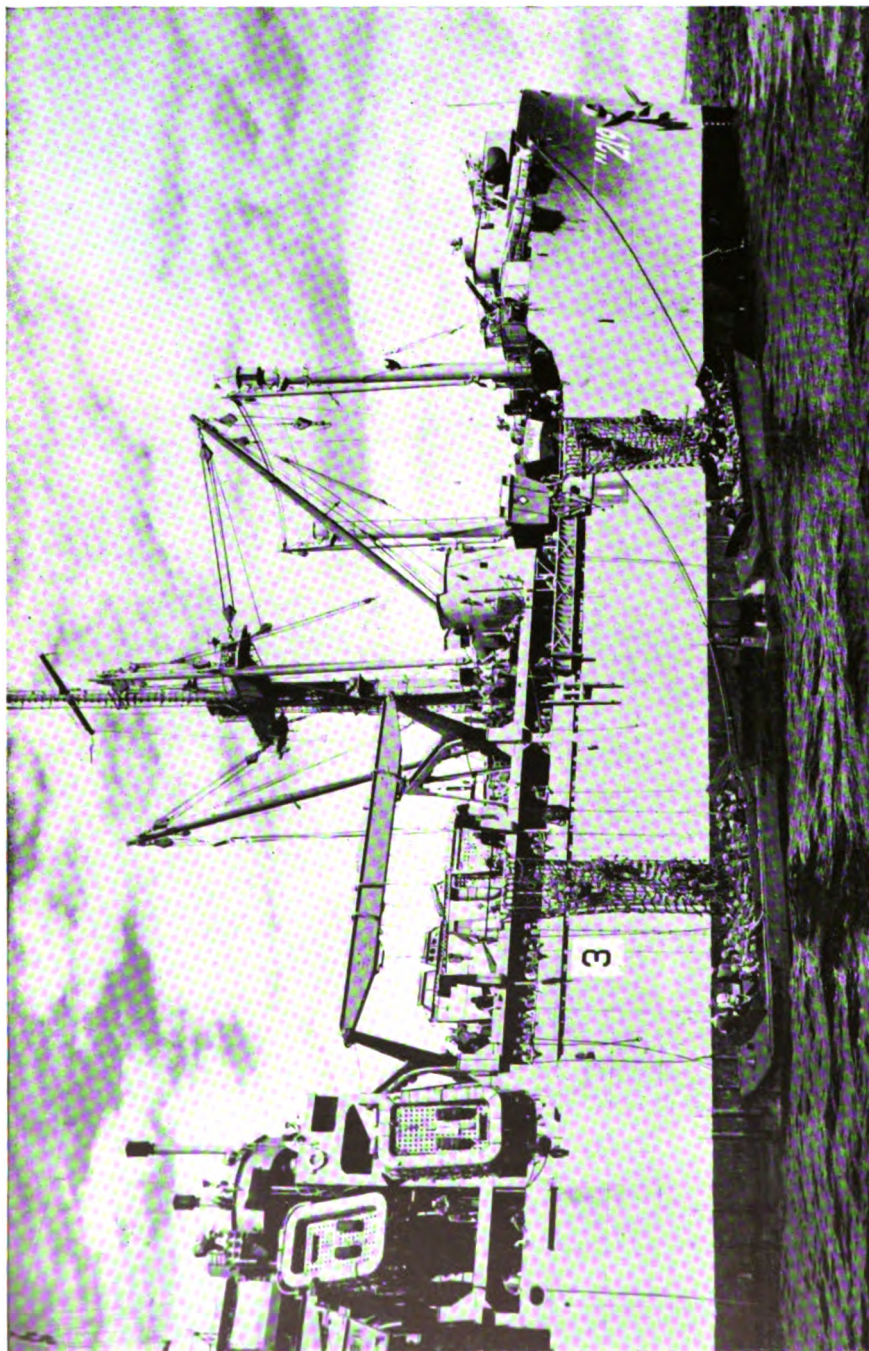


B.-T.-H. double-reduction gear for a British frigate

Courtesy of British Thomson-Houston



American Destroyer U.S.S. Glennon
U.S. Official Navy Photograph



U.S. amphibious manoeuvres in the Caribbean. Troops transferring from troopship to landing craft

U.S. Official Navy Photograph

normal circulation Wagner boiler. The United States Navy adhered to the natural circulation boiler and introduced controlled superheat with economisers, which, together with their higher steam pressures and temperatures, gave their ships a considerable improvement in fuel economy.

The Royal Navy's experience with economisers in the Belleville boiler at the end of the last century had not encouraged their continued use in the Service. With the development of new, lighter-weight designs and improvements in the purity and de-aeration of feed-water, however, it is probable that but for the international situation economisers would have been re-introduced into H.M. ships over ten years ago.

STEAM TURBINES

From 1933 onwards the Bureau of Engineering of the United States Navy undertook a comprehensive investigation into the development of steam turbines for the main propulsion of warships. This investigation was linked up with the current power-station practice and resulted in a fuel economy and reduction in weight for this type of propulsion that had never been equalled before.

In designing turbines for fighting ships the maximum full-power output and good economy at cruising speeds are two major factors. As the time spent at maximum full power is very small in comparison with that spent at cruising speeds, the United States Navy decided that fuel economy at full power was not in itself a major consideration. Particular study was therefore given to the problem of economy between 15–25 knots, and the following combinations were considered :

- (1) Cruising stages in the main high-pressure turbine.
- (2) Separate cruising turbine :
 - (a) Direct-connected to main high-pressure turbine.
 - (b) Geared to main high-pressure turbine.
 - (c) Geared through disconnecting clutch to main high-pressure turbine.

The arrangement of a cruising turbine always in gear with the main high-pressure turbine (2*b*) was chosen for destroyers and fast cruisers. Above 22 knots, instead of the cruising turbine exhausting into the high-pressure turbine it was arranged to exhaust into the cross-over pipe between the high-pressure and low-pressure turbines. For heavier and slower speed ships the cruising turbine was omitted and control of the steam supply to the high-pressure turbine was arranged by a series of control valves supplying steam to different stages. A valve arrangement similar to that used in industrial turbines was incorporated in the design, the control valves being operated by a camshaft. In later designs (1940) the cruising turbines in destroyers incorporated this camshaft control. From 1937 onwards many of the larger ships in the Royal Navy were fitted with cruising turbines geared through a disconnecting clutch to the main high-pressure turbine.

The turbine arrangement for most fighting ships in the Royal Navy for many years has been a Parsons reaction high-pressure turbine incorporating an impulse wheel at the inlet end, exhausting to a double-flow low-pressure turbine with an astern turbine at one end. Economy is effected by the

control of a group of nozzles at the steam inlet to the impulse wheel of the high-pressure turbine. In the past this control has been by hand-operated valves, but in the latest designs the United States Navy system of operating them in sequence by a camshaft has been adopted.

Even with the comparatively low steam conditions of 300 lb./sq. in. and 650° F. prolonged operation of the astern turbine was liable to cause overheating and damage to the ahead blading of the low-pressure turbine. With the change to higher steam conditions this problem became more acute and at first it was thought desirable to lower the steam temperature for astern working.

Investigations following an early casualty of this nature led to the adoption of an astern element at each end of the low-pressure turbine. Astern running with a temperature of 825° F. at the astern inlet elements has been carried out with this arrangement without overheating. Designs using higher steam conditions with a single astern wheel have to fit de-superheaters for astern working.

MAIN GEARING

As mentioned in "Brassey's Naval Annual," 1937, the Parsons improved involute tooth form, known as the A.A. or all-addendum gear, had been adopted in 1935 as standard in British warships. This form gave an increased tooth loading and resulted in a much lighter and more compact main gearing. Development work in Great Britain has since been mainly concentrated on improving the gear-cutting technique so as to increase the tooth loading still further, and research work in this field is being carried out by the Admiralty Vickers Gearing Research Association which was set up in 1945. Turbine speeds have been improved by increasing the reduction-gear ratios, and this has enabled the designer to reduce the turbine length for the same power.

Single-reduction gearing had been used in the Royal Navy until 1946, when its first double-reduction gears, designed and manufactured by British Thomson-Houston, Ltd., were fitted in two frigates. These have given satisfactory service, and double-reduction gears are being fitted in the latest destroyers.

In the United States in 1933 Mr. A. A. Ross of the General Electric Company proposed a new type of "locked train" main propulsion reduction gear which enabled a light-weight double-reduction gear of great rigidity to be built. The first of these gears were constructed by the De Laval Steam Turbine Company, and they were adopted as a standard arrangement for United States destroyers and larger warships. The new-design turbines run at speeds considerably above those in use with single-reduction gearing and in some instances the length of the high-pressure turbines has been reduced by one-third.

INTERNAL COMBUSTION ENGINES

Germany was the only country that developed the Diesel engine for main propulsion purposes in major fighting ships, the most notable examples being the "Deutschland" class "pocket" battleships, each of which was fitted with eight sets of double-acting two-stroke M.A.N. Diesels on two shafts developing a total of 54,000 b.h.p. at 450 r.p.m. The

last of these, the Admiral Graf Spee, was completed in 1936. Diesel engines were also fitted in other classes of German warships for use at cruising speeds.

Experience in the Royal Navy with Diesel engines for cruising purposes in major vessels has been confined to the cruiser-minelayer H.M.S. Adventure (1927), and two double-acting two-stroke M.A.N. Diesel engines were also fitted in the submarine depot ship H.M.S. Medway (1929) for main propulsion, but no further attempt was made to use Diesel engines for this purpose in large warships.

Following the construction of the German "pocket" battleships the United States Navy arranged an intensive research for a large-size double-acting two-cycle Diesel suitable for surface vessels, and a seven-cylinder 4,200 b.h.p. engine running at 420 r.p.m. was constructed. Further research with this type of engine was, however, not continued.

The Diesel engine for submarine propulsion has always been a specialised requirement. There is no counterpart to it in industry, and development work on this type of engine for the Royal Navy has been left largely to Messrs. Vickers and the Admiralty Engineering Laboratory (A.E.L.).

Before the Second World War, A.E.L. developed two single-cylinder units of 14½-inch and 17-inch bore which formed the basis for the "S" and "T" class submarines. These engines ran at 480 r.p.m. Comparative trials with engines of foreign manufacture showed that the Vickers and the Admiralty engines were every bit as good as, if not better than, the others; either Vickers or Admiralty engines were, therefore, adopted for all subsequent "T" class submarines, which gave such an excellent account of themselves in the War. In the smaller "U" class submarines a Diesel-electric drive was fitted, the two 270 kW. generators being driven by Paxman engines.

One development during this period, sponsored principally by the Germans and Japanese, was the midget submarine. The first German one-man "Biber" class submarine was fitted with petrol engines, but as these craft were only required to have a small radius of action this undesirable form of propulsion was changed to motors and batteries in the "Molch" class.

The heavy toll taken of the U-boats in 1942-43 led to the German development of the *schnorkel* to enable Diesel machinery to be run while the submarine is submerged. This device consists of two trunks; one for the air inlet and the other for the Diesel exhaust. A float-operated valve at the top of the trunk is fitted to prevent the influx of water when using this device in rough weather. The air is drawn into the body of the submarine after passing through a water trap, the Diesel exhaust being discharge just below the sea level.

Although in 1938 the Admiralty was working on the development of a light-weight design of Diesel engine for motor torpedo boats, no successful trials had been run by the time war broke out, and the American 1,250 h.p. Packard petrol engine was adopted as the standard engine for these craft.

The United States Navy developed an outstanding design of Diesel commonly known as the "Pancake" engine. This was manufactured by the General Motors Corporation and ran its acceptance trials in October, 1940. It was one of the lightest of its type, with only 4½ lb. per h.p. and it developed a full rating of 1,200 h.p. This engine was arranged

vertically with four cylinders to each horizontal layer, the four pistons in each layer being connected to one crank of a vertical four-throw crankshaft. A two-to-one bevel reduction gear transmitted its output to the horizontal propeller shaft. The engine was not reversible and the wooden sub-chasers in which it was first fitted were controlled by a variable-pitch propeller, operated from the bridge.

The year 1940 marked the beginning of a vast development and production programme for landing craft. In the smaller British-built craft, such as L.C.A. and L.C.M., the Royal Navy had to rely for the most part on American engines. For larger landing craft tank (L.C.T.) the Paxman 500 h.p. "T.P. 12" was available, and the later craft had two of these coupled together on each shaft through an oil-operated (S.L.M.) gearbox.

In the United States, where nearly 70,000 of the smaller landing craft were built, it was decided to standardise with a General Motors engine G.M. Model 6-71. This was originally known as the Gray Marine engine and developed 225 b.h.p. One or two of these engines were fitted to the smaller craft and three in L.C.T. on three shafts. The landing craft infantry (L.C.I.) had two shafts with four engines geared together on each shaft; this arrangement became known as the "Quad."

In the American landing ship tank (L.S.T.) two General Motors 12-567 engines were fitted, each driving a reverse and reduction gear through an air-operated Fawick, commonly known as the Falk Airflex, friction clutch. In 1942 the Diesel-electric drive was adopted for the American destroyer-escort vessels; this form of power unit was also fitted in a large number of auxiliary craft.

The vast expansion of the use of the Diesel engine of moderate powers was a notable feature of naval machinery development during the period under review. It led to a complete re-organisation of the system of engine maintenance and overhaul. Special new training establishments for the operating and maintenance personnel were set up in the United States and Great Britain, and landing craft and other small craft bases and overhaul depots were established at home and abroad.

One of the major difficulties was the supply of spare parts for internal combustion engines, to overcome which the Allies introduced a system of spare parts distribution centres and sub-depots throughout the world. This enabled a rationing system to be enforced and a flow of available material was arranged to these centres based on the number of vessels and craft operating in the different areas.

GAS TURBINES

Much time and thought have been expended in the last fifty years, particularly on the Continent, to the problem of producing a satisfactory internal-combustion turbine where the hot gases from the combustion of the fuel could be made to operate a turbine without resorting to the use of a boiler, as in a steam plant.

In 1940 the Admiralty Engineering Laboratory had begun development work on a free piston compressor unit and gas turbine. After the first successful flights of an aircraft fitted with the Whittle gas-turbine jet engine in 1941 investigations into the problem of designing a satisfactory

gas turbine unit for other services were intensified, and in 1942 the possibility of adapting the aircraft type of gas turbine for marine propulsion was being considered. It was eventually decided to carry out trials in a motor gunboat, M.G.B. 2009, of the Metropolitan-Vickers gas-turbine unit fitted in place of the centre-line reciprocating internal combustion engine; the wing internal combustion engines were retained for manœuvring purposes. This craft made naval history by running a series of successful trials in the Solent in August, 1947 and thus achieved the distinction of being the first vessel to be driven by this new form of propulsion.

Much research and development work with gas turbines is now taking place in Great Britain, on the Continent, and in the United States. Many prototypes for marine and industrial use are being built, but it may be a long time before gas turbines approach at all closely the efficiency and reliability over prolonged periods that steam turbines and Diesel engines have achieved.

The present designs of gas turbine are uni-directional, and for marine application where this type of plant is the sole means of propulsion some form of reversing arrangement is necessary. This may take the form of a reverse gearbox or controllable-pitch propeller. The development of this type of propeller has received much encouragement since the application of the gas turbine for main propulsion has become a reality.

FUEL OILS

In 1939 most of the boiler fuel oil used in British warships was Persian fuel to Admiralty specifications. With the closing of the Mediterranean in 1941 the majority of the fuel supplies had to come from Trinidad, Venezuela, and East American ports; these supplies were not up to the pre-war standard and this standard fell progressively lower as the increasing demands for aviation spirit made a greater degree of refining necessary.

During the war much trouble was experienced from the contamination of fuel oil by sea-water. This contamination was partly caused by leaks developing in fuel tanks of both warships and tankers under severe war-time steaming conditions and partly due to the necessity for ballasting fuel tanks at sea for ship-stability reasons. To a limited extent these troubles were overcome by the provision of settling and sullage tanks, but early experiences indicated that war-time fuels were liable to form a stable emulsion with sea-water that could not be broken down by heating. Burning of sea-contaminated fuels resulted in a considerable and often rapid deterioration of furnace brickwork and the formation of bonded deposits in the gas passages, particularly around superheater tubes.

Before 1939 when using a mixture of different fuel oils the United States Navy had experienced choking of filters and fuel heaters, and they later included stability and compatibility tests in their fuel specifications. For the war in the Pacific it was necessary that Iranian fuels should be fully compatible with those from American sources, and by a modification to the refinery procedure at Abadan it was found possible to achieve this.

Up to now, gas turbines have been operated only on light fuels. Any large-scale development of this type of propulsion for warships will necessitate the use of heavy fuel oil, and although it does not appear to have

had any immediate application to naval machinery, mention should be made of the experimental burning of heavy fuel in the main engines of the motor tanker *Auricula* in 1946-1948. The main principle of this modification consists of extracting impurities in the heavy oil by means of two centrifugal separators, one being described as the purifier and the other the clarifier. These trials have been most successful and the saving in running costs is considerable.

LUBRICATING OILS

For many years the Admiralty has used for turbine work a "straight" mineral oil known as Admiralty Special Mineral Lubricating Oil (S.M.L.O). This oil is free from chemical additives and has proved most reliable under rigorous steaming conditions. It will not, however, protect journals and gears from rusting if water is present in the oil.

Early in 1938 the United States Navy experienced an unusual amount of rusting of gears when using the approved lubricating oil in turbine systems. Special rusting tests were instituted and a corrosion-inhibiting turbine oil was developed which contained certain chemical additives. While corrosion-inhibiting oils are a safeguard against the action of fresh water they are not proof against corrosion by salt water. As lubricating oil systems are very liable to sea-water contamination after action damage in war-time, protection of turbine journals and gears from salt water corrosion is important. To arrest any such corrosion experiments have been carried out by adding small quantities of sodium nitrite to contaminated systems with satisfactory results, when using either S.M.L.O or the corrosion-inhibiting oil U.S. Navy Symbol 2190T.

Another development of the last ten years has been the production of heavy-duty oils containing detergent additives. These oils have their particular application to the internal combustion engine, where the effect of the detergent additives prevent the deposit of gums, resins, and soft carbons, and often remove these deposits from engines that have been running on a straight mineral oil. Use of these oils makes it possible for internal combustion engines to run satisfactorily for longer periods between overhauls.

MATERIALS

Until recently the temperatures at which marine machinery was operated had little effect on the life of the material. At the high temperatures now contemplated by the naval designer some of the materials at present in use approach a stage where their life is governed by a continued strain at constant load—a phenomenon known as creep. Because of their strength and creep-resisting properties, as compared with mild steel, alloy steels such as molybdenum steel have been adopted for high-pressure steam castings, forgings, and pipes. It was also the development of creep-resisting alloys, such as Nimonic 80, that did much to advance the development of the aircraft gas turbine.

Welding continues to find new applications in naval engineering. Fabricated gear-cases and low-pressure turbines are now common practice, and in boiler work there are welded boiler drums, superheater tubes, and other pressure parts. Welding has a particularly useful application to the quick repair of certain machinery parts.

Metal spraying has been adopted in recent years for many purposes, and is often used to reclaim such items as worn bearing journals and pump casings. It has limitations, but much valuable equipment is being saved by this means.

The effect of non-contact explosions of ground mines and near misses from bombs has affected naval material and machinery designs; brittle substances like ordinary cast-iron have been replaced by more ductile materials, and additional supports and special mountings for machinery have been devised to reduce the effect of shock.

SUMMARY

It will be appreciated that in a brief review such as this it is not possible to mention all the developments with which the naval engineer has been associated and the intention has been to record only the major developments in naval marine engineering.

There are two very significant developments of the last twelve years: firstly, the considerable rise in steam conditions and, secondly, the adoption of the gas turbine for certain naval applications. As steam pressures of 300 lb./sq. in. were used by the Royal Navy over fifty years ago the present trend of events represents an unusual advance in naval engineering. It has been associated with a closer link between the land and marine industries, the production of double-reduction gearing suitable for naval propulsion, an improvement in materials, a greater general realisation of the importance of research and development work, and the setting up of new research associations and boiler and engine testing establishments.

There is every reason to expect that the next decade will show itself to be a period full of even more interesting and important naval engineering developments.

A. FUNGE SMITH

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CHAPTER VII

The New Naval Science

RADAR—ITS GROWTH AND APPLICATION

OF ALL the scientific devices that have contributed to the efficiency of the fighting Services during the past decade none has had a greater influence than radar. It provides one of the most striking examples in the history of science of purely fundamental research being almost unexpectedly applied to a development of supreme practical importance. Indeed, the vital part this weapon performed in the war against Germany (and Japan) at sea, in the air, and on land was recognised by the German High Command as the greatest single device, even including the atom bomb, that brought total victory to the Allies.

Radar has, more than anything since the aeroplane, changed the face of warfare. It has removed the advantages of concealment and surprise in action which used to be given by darkness or the glare of the sun, fog, cloud, or artificial smoke—and the tactics of an attacker or defender have had to be modified accordingly.

His Majesty's Navy and the Fleet Air Arm (now called Naval Aviation) were quick to appreciate the significance of the new aid which promised so much—and readily fulfilled those promises. A new dimension was added to sea warfare. Enemy ships were detected and engaged while still beyond the horizon; they were ranged by radar and sunk by accurate gunfire without a single man seeing a visual target. Station-keeping, even in the most difficult conditions was made comparatively easy; and the assistance that radar techniques gave to navigation was so satisfactory that the Admiralty was moved to issue instructions to the effect that radar must be considered only as an aid to navigation lest the mariner's art be lost. Nevertheless, there can have been few navigating officers—more particularly those of the R.N.V.R. during the war—whose anxiety was not relieved on occasions by the reassuring confirmation of a position by radar.

Because of its many uses it will be obvious that the term radar, which was coined from the descriptive phrase "radio detection and ranging," refers to no single instrument; indeed, it covers anything from an installation weighing under 100 lb. borne in a fast fighter aircraft to massive assemblies of very elaborate equipment, which might weigh many tons, established in battleships and aircraft carriers. Such has been the rapid development of radar techniques since the beginning, and even before, the war.

EXPERIMENTS IN RADIO-LOCATION

Radar started its astonishing career as the basis for defence against air attack on the British Isles: thus historically its first active role was with the Royal Air Force, but almost simultaneously its possibilities were being explored by the Royal Navy.

The basic principles of this new naval science were established under the auspices of the Department of Scientific and Industrial Research.

In 1924 Dr. E. V. Appleton (now Sir Edward Appleton, Principal and Vice-Chancellor of Edinburgh University) approached the department's Radio Research Board with suggestions for experiments that would not only prove the existence of an electrically charged layer in the upper atmosphere, by which it was believed radio waves were reflected back to earth, but would also determine its height. Facilities were provided and in a short time he succeeded in measuring the time taken by radio waves to travel to the upper atmosphere—generally known as the Heaviside Layer—and return to the earth's surface. The radio-location of the layer in this way may therefore be taken as the first experiments in scientific range-finding by radio means.

In his early researches Sir Edward Appleton modulated his signal by wobbling the wavelength; the time interval in the measurements was less than a thousandth of a second, and it was obviously necessary to use an instrument sensitive enough to determine this brief interval. He used a cathode-ray oscillograph, later to be a feature of television sets. Afterwards Sir Edward Appleton adopted and widely extended the "pulse" technique, first used by Breit and Tuve, the American scientists, by which large bursts of energy of very short duration were transmitted. It was R. A. Watson-Watt (now Sir Robert Watson-Watt) who produced in 1935 the first practical and detailed proposals for locating targets by radio—and from that moment started the development of radar as we have come to know it. In September of that year the first radio-location, or R.D.F. station, as it was then called, was in operation. It was, indeed, the first radar installation anywhere in the world.

But in spite of this proud distinction Great Britain does not claim to have produced radar alone; it is known that research in the field was being pursued in several countries, particularly in the United States of America, and even before the U.S.A. entered the war the secrets of all British work on radar were communicated to the American Government. From 1940 there was a full exchange of information on the subject, and this most sensible co-operation between the Allies brought its own reward. It is perhaps symbolic that the era of mutual effort coincided with the adoption of a common name for the new means of detection. The comprehensive term of radar, which ingeniously suggests the principle of echo—since the word spells the same in either direction—was generally adopted in 1943; but it is as well to remember that radar now includes many important variations, such as radio navigational aids, which do not depend on the echo principle.

THE TECHNIQUE OF RADAR

In radar, unlike radio communications, the transmitter and receiver (which together comprise a complicated network of apparatus) are electrically tied, and they operate as a complete unit, usually with a common aerial. The transmitter is actually sending out energy only a very small part of the time—the "pulses" may only be a millionth of a second in duration. After each pulse, the transmitter waits a relatively long time, perhaps a few thousandths of a second, before sending out the next pulse. In the interval between the pulses the receiver is switched in circuit by a most ingenious device and the signals it receives are the echoes of the powerful transmitted pulses from those objects within range. It follows

that the nearer objects will give echoes very soon after the transmitter pulse is finished; those echoes from more distant objects will give later returns. The lapse of time between the transmission of the pulse and the reception of its echo is a measure of the distance from the transmitter's position to the object reflecting the pulse.

The measurement of these brief echo-intervals is one of the technical triumphs of radar. Since radio waves travel at 186,000 miles a second—the speed of light—or 328 yards in a millionth of a second and as the pulses must go out and back, an object 1,000 yards from the radar transmitter will give an echo only six millionths of a second after the transmitted pulse is finished. Time can now be related to a distance of less than ten yards, which corresponds to about one thirtieth of a millionth of a second.

Thus radar could establish with very considerable accuracy the range of a target; but it was equally important that radar should also be able to indicate the (perhaps unseen) object's bearing. This feat was achieved by the design of an aerial array with reflectors which projected the pulses along a narrow beam. The aerial was made to rotate—in the manner of a revolving searchlight—while serving its dual functions as a transmitter and collector of energy, so that echoes would be received from targets according to the bearing of the aerial at any particular moment.

In the early sets the aerial was turned by hand while the operator watched the screen in a darkened cabin. During the radar search the cathode-ray screen presented a horizontal line of light across the diameter of the tube—this was the time-base upon which was superimposed an appropriate distance scale. Each transmitted pulse was made to leave a mark—representing “zero-time”—at the extreme left of this line; to the right of the mark, somewhere along the horizontal path, a “blip,” or short vertical bar of light, would indicate an echo which would be so positioned on the time-base line that the target's range could be read off. The echo would be “held” by the operator, who read the steady bearing of the aerial, which would, of course, be the same as that of the target relative to the ship, and the range of the echo. This information was used to direct the ship's guns.

An even more spectacular indication of the range and bearing of a target is obtained from the “plan position indicator,” which provides a continuous picture of everything within radar “sight.” In this system the searching ship is represented as a spot of light in the centre of the screen; the aerial is rotated automatically at a constant speed, and as the beam sweeps round the ship so the echoes appear in their relative positions on the screen. The P.P.I. is characterised by an image that fades only gradually, and is reinforced each time the beam passes over it. From the navigational point of view this more recent development allowed a constant watch to be kept simultaneously on other ships in company, so that station-keeping in bad visibility and after dark was simplified. Land echoes also appeared with uncanny fidelity, and when moving in narrow waters the use of the P.P.I. was an added aid to the ship's safety. These are basic examples of the value of radar; but it also serves many specialised ends, and in all its varied applications a trained operator is needed to interpret the information correctly. Unlike television, the echoes do not appear as pictures of the particular targets sighted.

What might be called the sharpness of vision (in the optical sense) of a radar set—its ability to distinguish between two targets close together—depends on the narrowness of the transmitted beam. This was another problem with which the technicians had to contend, because beam-width is closely allied to the wave-length of the radio transmissions used. At the beginning of the war radar worked on wave-lengths of the order of 7 metres, with correspondingly broad beams unless very large aerials and reflectors were used; but quite soon it was realised that much higher transmission frequencies (shorter wave-lengths) were desirable—even the possibility of centimetric transmissions were contemplated. Thus the progress of radar became inextricably mixed with and very largely dependent upon the production of specialised valves which would give increased radiation powers at very high frequencies.

The original radar sets used existing valves, designed for continuous working in signalling technique; but a number of new developments were quickly introduced into their construction to help meet the need for radar's increasing demand for high power pulse generators. Great ingenuity was brought to bear in the production of new transmitter valves, but they remained essentially the triodes or multi-electrode types common to radio communication systems, and it was evident that a few decimetres were about the shortest wave-lengths to which they could be induced to function efficiently.

THE MAGNETRON—A BRITISH ACHIEVEMENT

The gates to the centimetric wave-lengths—that field of almost unlimited possibility—were opened in 1940 by the development of the magnetron, an outstanding contribution given by Great Britain to the science of radar. This new device made possible the generation of really high power pulses at very high frequencies—thus radar advanced into a new realm which had been little explored, because of the previous limitations of suitable equipment; but it was a region of the radio spectrum, as experiment had already proved, that would allow much greater accuracy in the many applications of radar. This revolutionary advance—it cannot be overstated—came after a great effort at the Birmingham University Physics Laboratory, where Professor J. T. Randall and Dr. H. A. H. Boot developed a prototype of the cavity magnetron which soon went into industrial production. With this 10-centimetre pulse generator the technicians had acquired a new instrument for research; before long modifications were made, and, largely by a joint effort of the Birmingham team and the British Thomson-Houston Company at Rugby, the magnetron was eventually persuaded to deliver power at 3 centimetres. Professor Randall, Dr. Boot, and Professor J. Sayers, who was responsible for the later improvements to the magnetron, have since been awarded the sum of £36,000 for their work by the Royal Commission on Awards to Inventors.

Sir Henry Tizard led a British technical mission to Washington in 1940 and took with him the original British magnetron, which remains a treasured relic in a U.S. radar laboratory. The Americans in their turn made great contributions to the techniques of both design and manufacture after some of the early difficulties encountered in production were successfully overcome. It is interesting to note that the Americans, while experimenting with shorter wave-lengths, have favoured 10-centimetre radar

until very recently; there is now, however, a growing appreciation for the 3-centimetre system, which has, since its introduction, been the principal field of research in Great Britain.

NAVAL GUNNERY: A NEW ORDER OF ACCURACY

When radar first came to the ships of the Royal Navy they were fitted with the 1½-metre equipment, and its primary function was to give early warning of approaching aircraft; but very soon it was being applied directly to gunnery control and for navigational purposes after dark. Indeed, radar had very quickly become essential; with its piercing eye, which was incomparably more efficient than the finest human look-out, the horizon and beyond was scanned and formations of aircraft were spotted when they were 100 miles away. The Commander-in-Chief of the Home Fleet declared that radar had brought the greatest revolution in naval tactics since the change from sail to steam. It raised naval gunnery to a new order of accuracy.

The problem of defending a force of warships from air attack is more complex than that of defending a land area; the particular problems are reflected in different radar techniques. First of all, the ships are moving; they also roll and pitch and yaw; they twist and turn and vary their speed. The radar controlling gunfire must take all this movement into account while striving to place a shell near enough to destroy its speeding target.

Equipments suitable to naval conditions were designed by the Admiralty Signal Establishment, which had grown out of H.M. Signal School, and before long it had expanded into an immense organisation of 4,700 persons, under Captain B. R. Willett, R.N. He was succeeded at the end of 1943 by Captain P. W. B. Brooking, R.N., who organised the provision of radio and radar systems for the invasion of Europe. At the end of 1939 the Establishment began to design a radar rangefinder using 50-centimetre waves, which was free from the fundamental defects of its optical counterpart. After much experimental work a prototype set was fitted in a ship. Remarkably good results were obtained, due in part to the phenomenon of anomalous propagation of radio waves, which was not perfectly understood at the time, and a convoy at 30,000 yards was successfully ranged. "Type 284" of these 50-centimetre rangefinders was fitted in H.M.S. Suffolk, and enabled her to pick up and shadow the Bismarck through the Denmark Straits in 1941. This feat confirmed the set's operational reputation, and its ultimate reward came when Type 284 materially assisted in the destruction of the Scharnhorst.

Radar gun-laying gave ranges accurate to within a few yards; it was a constant error regardless of the firing range, while the optical rangefinder's error increased in proportion to the square of the range. Actual splashes from the fall of shot can be plotted by radar, and the system of visual gunnery "spotting" could often be suspended. Fire could be opened at greater ranges and against unseen targets. A brilliant example of the greatest strategical importance was seen in the Battle of Matapan, which had a decisive influence on the war in the Mediterranean. It prevented the Italian Fleet from interfering with the withdrawals from Greece and Crete: it relieved the Malta convoy situation, and turned the scale at the moment of our greatest peril. Forewarned, H.M. ships were brought to instant fighting readiness long before the enemy knew of their presence;

and when the Italian ships were illuminated by searchlight a few seconds before H.M.S. Warspite fired her first radar-directed broadside, the enemy's guns were still trained fore and aft. Five of the six 15-inch shells in that first broadside secured hits. Three enemy cruisers and two destroyers were sunk. In the Scharnhorst action, the enemy was first detected far beyond gun range with 10-centimetre equipment by the cruiser Belfast, which presently opened fire. The enemy then abandoned her attack on the convoy bound for North Russia; she was shadowed by destroyers' radar until the Duke of York was able to close her range and open fire at 12,000 yards, which was controlled by her 50-centimetre gunnery sets. Most of the salvos were fired "blind," and the deciding one was fired entirely on radar information. On this occasion, and when the Bismarck was engaged, the weather was unfavourable to visual detection, and it is doubtful whether these ships would have been sunk without radar.

In convoy escort work, indeed, in anti-submarine warfare generally, radar was of the utmost value, and its introduction in destroyers and corvettes at once gave the Allies a weapon which confounded the enemy's tactics. Very soon he realised that to surface after dark in the vicinity of a convoy was to invite attack; even his periscope (and later, the *schorkel*) gave a reasonable echo at several miles' range. Thus, being unable to stalk a convoy perhaps for days and nights before making an attack in company with other submarines, it became more prudent for several U-boats to lie in wait ahead of a convoy. Several alternative schemes of attack were tried. Perhaps the most successful one was to wait till the escorts leading the convoy had passed over (this state was recognised by the submarines' hydrophones); the enemy then surfaced astern of the escorts, with the convoy slowly approaching. In this position it was difficult for the anti-submarine force to attack. Very soon the U-boats were among the lines of ships, and little could be done to save them. Counter measures were quickly taken and, generally speaking, radar converted anti-submarine warfare from the defensive to an offensive role: it became the practice, when there were sufficient escort vessels, persistently to hunt the submarine from the moment it left port; whereas before radar was fitted to H.M. ships they counter-attacked in the main only after an attack by the enemy had disclosed his presence. The pursuit of blockade runners, supply ships, and E-boats was equally facilitated by radar.

From the navigational point of view in convoy work the use of radar was also of considerable value, because the officer of the watch always had a picture at night and in fog of the ever-zig-zagging assembly of ships. A single mistake in zig-zagging or a late turn might all too easily bring ships into collision, but that risk was almost eliminated; station-keeping by the convoy escorts was made simple, and an ever-watchful eye could be kept on the convoy's formation. Stragglers, which had previously been easy prey for the lurking U-boat, could be protected and given encouragement to regain station.

MOMENTS OF EMBARRASSMENT

But the use of this new scientific aid, which allowed guns' crews to be at action stations and the whole ship "closed-up" before being attacked

in bad visibility, brought its own moments of embarrassment. Radar could not discriminate between friend and foe. Therefore, a system known as "secondary radar" was developed. This "I.F.F." responder (Interrogation—Friend or Foe) was a small set, which was "triggered" by the normal radar pulses, and in return transmitted a code so that the identity of a ship disclosed on the radar screen could be established. The code also gave other valuable information—such as "I am in contact with a submarine." I.F.F. was entirely automatic; it was carried in aircraft and ships, and when switched on would remain quiescent until it was triggered. It was both guardian and a slave.

To the aircraft carriers of the Fleet Air Arm radar has provided other benefits. Apart from its active uses, which were common to most fighting ships, it enabled a plot to be kept of the aircraft as they were flown off the carrier; it was possible to keep track of them all the time and to direct them to their targets. The aircraft could also be brought back to the ship and landed in weather which, a few years earlier, would have made flying quite impossible. Fighters have been able to intercept hostile aircraft which might otherwise have been right over their targets before being discovered had it not been for radar's early warning.

The techniques of radar are so varied that it defies a concise definition. It cannot claim to depend only on the principle of echo response, because "secondary radar" uses a "triggered" pulse for identification; and there are other navigational systems which do not require co-operation at all. Among them are Gee and Loran—both purely radar navigational aids using pulse transmissions to produce an interlaced pattern of lines with a constant time difference between them. They involve the measurement of absolute times of travel of signals from one master transmitting station and associated slave stations.

Other radio navigational aids (which are outside the scope of this article) are also used by the Navy; but Sir Robert Watson-Watt has expressed the belief that only those radar-like systems will survive in universal use because of their substantial immunity from the disturbances due to undesired reflections and because of the rapidity with which an unambiguous fix can be obtained. In contrast to the traditional methods of navigation by the sun and the stars, which allow a ship's position to be established within about a mile—for a fast carrier-borne fighter aircraft it would be of an order of ten miles—radar navigation under good conditions will provide an accuracy of literally a few yards.

CONCLUSION

The conception of radar and its rapid progress towards perfection in so short a time invites speculation as to the ultimate value of its many applications. In the King's ships it has been shown that radar has already assumed the highest responsibility; improvements continue to be made and the final form—if it ever comes—must surely be a monument to man's ingenuity. The way of all developments in science stem from existing techniques; and it is truest of radar that its progress must ever be a carefully guarded secret.

W. H. KENNETT

REFERENCE SECTION.

DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS.

Warships are arranged in classes, except in some instances where they are arranged alphabetically. The following abbreviations are used throughout the List:—

a.g.b. Armoured gunboat.	A.T. Aircraft tender.
g.b. Gunboat.	M.C. Escort carrier.
b. Battleship.	S.C. Seaplane carrier.
b.c. Battle cruiser.	H.N.S. Harvey nickel steel.
l.cr. Light cruiser.	H.S. Harveyised or similar hard-faced steel.
c.d.s. Coast-defence ship.	K.S. Krupp steel.
A.M.Cr. Armed Merchant cruiser.	t. Speed and H.P. at trials (in speed and H.P. columns).
M.Cr. Minelaying cruiser.	b.p. Length of ship between perpendiculars.
cr. Cruiser.	
A.A. or H.A. Anti-aircraft guns.	
A.C. Aircraft carrier.	
L.A.C. Light Aircraft carrier.	
L. Light guns under 15 cwt., including boats' guns.	
M. Machine guns.	
m.p.p. Multiple pom poms.	

Torpedo Tubes; (D.) = double; (T.) = triple; (Q.) = quadruple; (sub.) = sub-merged; a.w. = above water.

The following abbreviations are used to distinguish the various types of boilers:—

W.T. Water-tube boilers, where the type is not known.	I. Indret.
A. Ansaldo.	K. Kanpon.
B. Belleville.	My. Miyabara.
Bl. Blechynden.	Nic. Niclausse.
B. & W. Babcock and Wilcox.	Pen. Penhoet.
D'A. D'Allest.	T. Thornycroft.
G. Guyot.	T.S. Thornycroft-Schulz.
	W.F. White-Forster.
Y. Yarrow.	

The following abbreviations distinguish types of machinery:—

P.T. Parsons turbines.	tur. Turbines, where the type is not known.
C.T. Curtis turbines.	R. Steam reciprocating engines.
B.C.T. Brown-Curtis turbines.	I.C. Internal combustion engines.
(G.) Geared turbines.	W.G.T. Westinghouse geared turbines.
D. Diesel.	
Rat. Rateau.	

In later pages (marked P1, P2, etc., towards the end of the volume) plans of most of the ships appear.

Unless otherwise stated, the displacements are Standard displacements (i.e. deep less fuel and reserve feed water).

**THE BRITISH COMMONWEALTH.
GREAT BRITAIN—BATTLESHIPS.**

Class	NAME	Standard Displacement	Length (extreme)	Beam (extreme)	Normal draught	Horse power	Where built	Makers of engines	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Complement (war)		
												Belt	Deck	Side above belt	Bulkhead	Gun Position		Guns	Torpedo tubes				
b.	Vanguard	42,500 tons	814 ft.	108 ft. in.	28 ft. in.	130,000	Brown	Brown P.T.(G.)	1944	1946	£	in.	in.	in.	in.	in.	Heavy guns	Secondary	8 15-in., 16 5-2-in., about 70/40 mm. A.A. guns.	Nil	28+	knots	
b.	King George V	35,000 tons	745	103 ft. in.	28 ft. in.	110,000	Vickers (Walker)	Vickers P.T.(G.)	1939	1941		in.	in.	in.	in.	in.	in.	in.	10 14-in., 16 5-25-in.; many light A.A. guns.		28+	1500	
b.	Duke of York	"	"	"	"	"	Brown	Brown P.T.(G.)	1939	1941		in.	in.	in.	in.	in.	in.	in.	"	"	"	"	"
b.	Howe	"	"	"	"	"	Fairfield	Fairfield P.T.(G.)	1940	1942		in.	in.	in.	in.	in.	in.	in.	"	"	"	"	"
b.	Anson	"	"	"	"	"	Swan Hunter	Wallsend P.T.(G.)	1940	1942		in.	in.	in.	in.	in.	in.	in.	"	"	"	"	"

GREAT BRITAIN.—AIRCRAFT CARRIERS.

Class	NAME	Stand- ard dis- place- ment	Length (ex- treme)	Ex- treme breadth under water over rubbers	Draught	Horse- power Type of boiler	Where built	Maker of engines Type of machinery	Date of launch	Date of com- ple- tion	Cost £	Armour		Armament		Com- ple- ment (war)
												Belt Deck	Gun posi- tion	Guns	Tor- pedo tubes	
A.C.	Eagle	tons 36,800	ft.	ft. in.	ft. in.		Harland & Wolff (Belfast) Cammell Laird	Harland & Wolff (Belfast) Cammell Laird	1946		£	in.	in.	16 4.5-in. guns		knots
A.C.	Art Royal	"							Bldg.					"	"	32
A.C.	Indefatigable	23,000	760	95 9	22 4	140,000	Brown Fairfield	Brown Fairfield	1942	1944				16 4.5-in. guns.		32
A.C.	Implacable	"	"	"	"	"			1942	1944				"	"	"
A.C.	Illustrious	23,000	740	95 9	22 4	111,000	Vickers (Barrow)	Vickers (Barrow)	1939	1940				16 4.5-in. guns ; 20 smaller.		30½
A.C.	Victorious	"	"	"	"	"	Vickers (Walker)	Vickers WallSEND	1939	1941				"	"	"
A.C.	Formidable	"	"	"	"	"	Harland & Wolff (Belfast)	Harland & Wolff (Belfast)	1939	1940				"	"	"
A.C.	Indomitable	"	"	"	"	"	Vickers (Barrow)	Vickers (Barrow)	1940	1941				"	"	"
Colossus Class L.A.C.	Colossus *	14,000	695	80 0	23 0	40,000 P.T.(G.)	Vickers (Walker) Swan	Vickers WallSEND	1943	1944				6 m.p.p. ; a number of light A.A. guns.		25
"	Vengeance	"	"	"	"	"	Hunter	WallSEND	1944	1945				"	"	"
"	Glory	"	"	"	"	"	Harland & Wolff	Harland & Wolff	1944	1945				"	"	"
"	Ocean	"	"	"	"	"	Stephen Vickers	Stephen Parsons	1944	1945				"	"	"
"	Perseus	"	"	"	"	"	Vickers (Walker)	Parsons	1944	1945				"	"	"
"	Theseus	"	"	"	"	"	Fairfields	Fairfields	1944	1946				"	"	"

* On loan to French Navy.

GREAT BRITAIN.—AIRCRAFT CARRIERS—continued.

Class	NAME	Stand- and dis- place- ment	Length (ex- treme)	Ex- treme breadth under water over rubbers	Draught	Horse- power Type of boiler	Where built	Maker of engines Type of machinery	Date of launch	Date of com- ple- tion	Armour			Armament		Com- ple- ment (war)
											Cost	Belt Deck	Gun posi- tion	Guns	Tor- pedo tubes	
Colossus Class— cond. L.A.C.	Triumph	tons 14,000	ft. 695	ft. in. 80 0	ft. in. 23 0	40,000 P.T.(G.)	Hawthorn Leslie	Hawthorn Leslie	1944	1946	£	in.	in.	6 m.p.p.; a number of light A.A. guns.		knots 25
	Warrior	"	"	"	"	"	Harland & Wolff	Harland & Wolff	1944	1946				"		"
Majestic Class L.A.C.	Hercules	"	695	112 max. at F.D.	21 4	40,000	Vickers (Walker)	Parsons	1945	?				4 3-pdr., 30 40-mm. A.A., 40 aircraft.		25
	Leviathan	"	"	"	"	"	Swan	Wallisend	1945	?				"		"
" "	Majestic	"	"	"	"	"	Hunter	Vickers	1945	?				"		"
	Powerful	"	"	"	"	"	(Barrow)	(Barrow)	1945	?				"		"
Hermes Class A.C.	Albion	18,300	736 6	90 0		83,000	Harland & Wolff	Harland & Wolff	1945	?				8 4.5-in.		30
	Bulwark	"	"	"	"	"	Swan	Wallisend	1947					"		"
" "	Centaur	"	"	"	"	"	Hunter	Harland	1948					"		"
	Hermes	"	"	"	"	"	Harland & Wolff	Harland & Wolff	1947					"		"
E.C.	Campania	"	"	"	"	"	Vickers (Barrow)	Vickers (Barrow)	Bldg.					"		"
		"	"	"	"	"	Harland & Wolff	Harland & Wolff						"		"

GREAT BRITAIN.—CRUISERS.

Class	NAME	Stand- ard dis- place- ment	Length (ex- treme)	Beam (ex- treme)	Draught	Horse- power. Type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of com- ple- tion	Cost	Armour		Armament		Com- ple- ment Speed (war)
												Belt Deck	Gun posi- tion	Guns	Tor- pedo tubes	
Norfolk Class London Class	Norfolk	tons 9826	ft. 633	ft. in. 66 0	ft. in. 17 0	80,000 P.T.(G.)	Fairfield	Fairfield	1928	1890	£ 2,141,961	in.	in.	6 8-in., 8 4-in. A.A., many light A.A. guns.	8 21" (Q.)	knots 32½
	Sussex	9830	633	66 0	17 0	80,000 P.T.(G.)	Hawthorn Leale	Hawthorn Leale	1928	1929	1,975,800†			8 8-in., 8 4-in. A.A., many light A.A. guns.	"	32½
	Devonshire *	9850	630	66 0	17 0		Devonport	Vickers	1927	1928	2,007,275			2 8-in., 8 4-in. A.A. guns.	—	"
Improved South- ampton Class	London	9850	630	66 0	17 0		Port- smouth	Fairfield	1927	1929	1,966,559			8 8-in., 8 4-in. A.A., many light A.A. guns.	8 21" (Q.)	"
	Bedford	10,000	613½	63 4	17 3	80,000 P.T.(G.)	Harland & Wolff	Harland & Wolff	1938	1939	2,176,731			12 6-in., 8 4-in. A.A., many smaller, 3 aircraft, 1 catapult. (T)	6 21" (T)	32½
	Liverpool	9400	591½	62 4	17 5	82,500 P.T.(G.)	Fairfield	Fairfield	1937	1938				9 6-in., 8 4-in. A.A., many smaller.	6 21" (T)	32
South- ampton Class	Newcastle	9100	591½	61 8	17 0	75,000 P.T.(G.)	Vickers (Walker)	Vickers	1936	1937	1,960,000			" "	"	"
	Glasgow	"	"	"	"	"	Scotts	Scotts	1936	1937	"			" "	"	"
	Sheffield	"	"	"	"	"	Vickers (Walker)	Vickers	1936	1937	"			" "	"	"
	Birmingham	"	"	"	"	"	Devonport	Brown	1936	1937	"			" "	"	"

* Cadets' Training Cruiser.

GREAT BRITAIN.—CRUISERS—continued.

Class	NAME	Stand- ard dis- place- ment	Length (ex- treme)	Beam (ex- treme)	Draught	Horse- power, Type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of com- ple- tion	Cost £	Armour		Armament		Com- ple- ment (war)
												Belt Deck	Gun posi- tion	Guns	Tor- pedo tubes	
Tiger Class	Tiger	tons	ft.	ft. in.	ft. in.		Brown	Brown	1945	Bldg.	£	in.	in.			knots
	Defence	"	"	"	"		Scotts	Scotts	1944	"						
	Blake	"	"	"	"		Fairfields	Fairfields	1945	"						
Swiftsure Class	Swiftsure	8000	555½	63 0	16 3	72,500 P.T.(G.)	Vickers (Walker)	Vickers	1943	1944				9 6-in., 4 m.p.p., several smaller.	6 21"	32
	Superb	"	"	"	"	"	Swan Hunter	Wallsend	1943	1945				9 6-in., 8 4-in. A.A., 16 smaller.	6 21"	"
Uganda Class	Ceylon	8000	555½	62 0	16 6	72,500 P.T.(G.)	Stephen	Stephen	1942	1943				"	"	"
	Newfoundland	"	"	"	"	"	Swan Hunter	Wallsend	1941	1943				"	"	"
Fiji Class	Bermuda	8000	555½	62 0	16 6	72,500 P.T.(G.)	Brown	Brown	1941	1942				9 6-in., 8 4-in., 16 smaller.	6 21"	32
	Gambia	"	"	"	"	"	Swan Hunter	Wallsend	1940	1942				(Gambia and Nigeria have 12 6-in. guns.)	"	"
Jamaica	Jamaica	"	"	"	"	"	Vickers	Vickers	1940	1942				"	"	"
	Mauritius	"	"	"	"	"	Swan Hunter	Wallsend	1939	1941				"	"	"
Kenya	Kenya	"	"	"	"	"	Stephen	Stephen	1939	1940				"	"	"
	Nigeria	"	"	"	"	"	Vickers	Parsons	1939	1940				"	"	"
Arethusa Class	Arethusa	5220	506	51 0	13 10	64,000 P.T.(G.)	Chatham	Parsons	1934	1935	1,280,463			6 6-in., 8 4-in. A.A., 9 smaller.	6 21"	500

Leander Class	Ajax	6885	5544	55 8	16 0	72,000 P.T.(G.)	Vickers	Vickers	1934	1935	1,491,417		6 6-in., 8 4-in. A.A., many light A.A. guns. (8 6-in. in Orion.)	8 21" (Q.)	32†	680
	Orion	7215	"	"	"	"	Devonport	Vickers	1932	1934	1,548,663		"	"	"	"
	Leander	7270	"	55 2	"	"	"	"	1931	1933	1,667,819		"	"	"	"
Dido Class	Argonaut	5450	506	50 5	14 0	62,000 P.T.(G.)	Cammell Laird Fairfields	Cammell Laird Fairfields	1941	1942			8 5.25-in. (Dido and Sirius have 10 5.25-in., and Scylla has 8 4.5-in.) many light A.A. guns.	6 21" (T)	33	
	Bellona *	"	"	"	"	"	"	"	1942	1943				"	"	
	Black Prince *	"	"	"	"	"	Harland & Wolff Hawthorn	Harland & Wolff Hawthorn	1942	1943				"	"	
	Geopatra	"	"	"	"	"	"	"	1940	1941				"	"	
	Diadem	"	"	"	"	"	Hawthorn	Hawthorn	1942	1944			"	"	"	
	Dido	"	"	"	"	"	Cammell Laird Chatham	Cammell Laird Hawthorn	1939	1940			"	"	"	
	Euryalus	"	"	"	"	"	"	"	1940	1941			"	"	"	
	Phoebe	"	"	"	"	"	Fairfields	Fairfields	1939	1940			"	"	"	
	Royalist	"	"	"	"	"	Scotts	Scotts	1942	1943			"	"	"	
	Scylla	"	"	"	"	"	Scotts	Scotts	1940	1942			"	"	"	
	Sirius	"	"	"	"	"	Portsmouth	Scotts	1940	1942			"	"	"	

* Transferred to Royal New Zealand Navy.

GREAT BRITAIN.—FLOTILLAS.

DESTROYERS.

Name or Number	Built by	Completed	Dimensions			Number of screws	Standard displacement	Horse-power	Mean speed on trial, or expected	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
<i>Daring Class :</i>			Feet	Feet	Feet		Tons		Knots			
Daring	Swan Hunter	Bldg.	390	43	12½	2	2620			6 4.5 in. 10 40 mm.	10	21"
Dainty	Samuel White	"										
Diamond	John Brown	"										
Decoy	Yarrow	"										
Diana	"	"										
Defender	Stephen	"										
Delight	Fairfield	"										
Duchess	Thornycroft	"										
<i>Weapon Class :</i>												
Battleaxe	Yarrow	1947	365	38	12½	2	1980	40,000	34	4 4.5-in. HA/LA in twin mount- ings	10	21"
Broadsword	Yarrow	1948										
Crossbow	Thornycroft	1948										
Scorpion	White	1947										
<i>Battle Class :</i>												
Agincourt (Ldr.)	Hawthorn Leslie	1947				2	2325	59,000		4 4.5-in. in twin mount- ings	10	21"
Alamein (Ldr.)	Hawthorn Leslie	1948										
Aisne	Vickers (Walker)	1947					2315					
Barrosa	Brown	"										
Corunna	Swan Hunter	"										
Dunkirk	Stephen	"								1 4.5-in. single, many 40 mm.		
Jutland	"	"										
Matapan	Brown	"										
Armada (Ldr.)	Hawthorne Leslie	1945				2	2325	59,000	36	4 4.5-in. 12 40 mm.	8	21"
Saintes (Ldr.)	"	1946										
Solebay	"	1945					2315					
Cadiz	Fairfields	1946										
St. James	"	"										
Vigo	"	"										
Gravelines	Cammell Laird	"										
Sluys	"	"										
Trafalgar (Ldr.)	Swan Hunter	1945				2	2325	59,000	36	4 4.5-in. 12 40 mm.	8	21"
Barfleur (Ldr.)	"	"										
St. Kitts	"	1946					2315					
Gabbard	"	"										
Lagos	Cammell Laird	1945										
Hogue	"	"										
Finisterre	Fairfield	"										
Camperdown	"	"										
<i>*Crescent Class :</i>												
‡ Crescent (Ldr.)	Brown	1945	362½	35½	10	2	1710	40,000	37	4 4.5-in.	4	21"
‡ Crusader	"	"										
‡ Crispin	White	1946										
‡ Creole	"	"										
<i>Cossack Class :</i>												
Cossack (Ldr.)	Vickers (Walker)	1945	"	"	"	"	"	"	"	"	"	"
Cockade	Yarrow	"										
Comet	"	"										
Constance (Ldr.)	Vickers (Walker)	"										
Comus	Thornycroft	1946										
Concord	"	"										
Contest	White	1945										
Consort	Stephen	1946										
<i>Chequers Class :</i>												
Chequers (Ldr.)	Scott	1945	"	"	"	"	"	"	"	"	"	"
Chaplet	Thornycroft	"										
Chevron	Stephen	"										
Chieftain (Ldr.)	Scott	1946										
Charity	Thornycroft	1945										
Cheviot	Stephen	"										
Childers	Denny	"										
Chivalrous	"	1946										

* Remaining four vessels of Crescent Class sold to Norway.

‡ On loan to Royal Canadian Navy.

Great Britain—DESTROYERS.

Name or number	Built by	Completed	Dimensions			Number of screws	Standard displacement	Horse-power	Mean speed on trial, or expected	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
<i>Cæsar Class :</i>												
Cavendish (Ldr.)	Brown	1944	Feet 362½	Feet 35½	Feet 10	2	Tons 1710	40,000	Knots 37	4 4·5-in.	8 21" (Q)	
Cæsar (Ldr.)	White	"	"	"	"	"	"	"	"	"	"	
Carysfort	Scott	1945	"	"	"	"	"	"	"	"	"	
Carron	White	1945	"	"	"	"	"	"	"	"	"	
Cavaller	Yarrow	"	"	"	"	"	"	"	"	"	"	
Caessandra	"	"	"	"	"	"	"	"	"	"	"	
Caprice	"	"	"	"	"	"	"	"	"	"	"	
Cambrian	Scott	"	"	"	"	"	"	"	"	"	"	
<i>Zambesi Class :</i>												
Zephyr (Ldr.)	Vickers (Walker)	1944	"	"	"	"	"	"	"	"	"	
Mynga (Ldr.)	Denny "	"	"	"	"	"	"	"	"	"	"	
Zenith	Thornycroft	1945	"	"	"	"	"	"	"	"	"	
Zodiac	Denny	"	"	"	"	"	"	"	"	"	"	
Zebra	Cammell Laird	"	"	"	"	"	"	"	"	"	"	
Zealous	"	"	"	"	"	"	"	"	"	"	"	
Zambeal	"	"	"	"	"	"	"	"	"	"	"	
Zest	Thornycroft	1945	"	"	"	"	"	"	"	"	"	
<i>Wager Class :</i>												
Kempenfelt (Ldr.)	Brown	1943	"	"	"	"	"	"	"	4 4·7-in.	"	
Whirlwind	Hawthorn Lealle	1944	"	"	"	"	"	"	"	"	"	
Wrangler	Vickers (Barrow)	"	"	"	"	"	"	"	"	"	"	
Wessex	Fairfields	"	"	"	"	"	"	"	"	"	"	
Whelp	Hawthorn Lealle	"	"	"	"	"	"	"	"	"	"	
Wager	Brown	"	"	"	"	"	"	"	"	"	"	
Wizard	Vickers (Barrow)	"	"	"	"	"	"	"	"	"	"	
Wakeful	Fairfield	"	"	"	"	"	"	"	"	"	"	
<i>Valentine Class :</i>												
Volage	White	1944	"	"	"	"	"	"	"	4 4·7-in.	"	
Verulam	Fairfield	1943	"	"	"	"	"	"	"	1 m.p.p.	"	
Virago	Swan Hunter	"	"	"	"	"	"	"	"	or twin 40 mm.	"	
Vigilant	"	"	"	"	"	"	"	"	"	"	"	
Venus	Fairfield	"	"	"	"	"	"	"	"	"	"	
<i>Ulsster Class :</i>												
Grenville (Ldr.)	Swan Hunter	1943	"	"	"	"	"	"	"	"	"	
Ulsster	"	"	"	"	"	"	"	"	"	"	"	
Ulysses	Cammell Laird	"	"	"	"	"	"	"	"	"	"	
Undaunted	"	1944	"	"	"	"	"	"	"	"	"	
Undine	Thornycroft	1943	"	"	"	"	"	"	"	"	"	
Urania	Vickers (Barrow)	1944	"	"	"	"	"	"	"	"	"	
Urchin	"	1943	"	"	"	"	"	"	"	"	"	
Ursa	Thornycroft	1944	"	"	"	"	"	"	"	"	"	
<i>Troubridge Class :</i>												
Troubridge (Ldr.)	Brown	1943	"	"	"	"	"	"	"	"	"	
Teazer	Cammell Laird	"	"	"	"	"	"	"	"	"	"	
Tenacious	"	"	"	"	"	"	"	"	"	"	"	
Termigant	Denny	"	"	"	"	"	"	"	"	"	"	
Terpsichore	"	"	"	"	"	"	"	"	"	"	"	
Tumult	Brown	"	"	"	"	"	"	"	"	"	"	
Tuscan	Swan Hunter	"	"	"	"	"	"	"	"	"	"	
Tyrian	"	"	"	"	"	"	"	"	"	"	"	
<i>Saumarez Class :</i>												
Saumarez (Ldr.)	Hawthorn Lealle	1943	"	"	"	"	"	"	"	"	"	
Savage	"	"	"	"	"	"	"	"	"	"	"	
<i>Rotherham Class :</i>												
Racehorse	Brown	1942-43	358½	"	"	"	"	"	"	"	"	
Rapid	Cammell Laird	"	"	"	"	"	"	"	"	"	"	
Relentless	Brown	"	"	"	"	"	"	"	"	"	"	
Rocket	Scotts	"	"	"	"	"	"	"	"	"	"	
Roebuck	"	"	"	"	"	"	"	"	"	"	"	
<i>Quilliam Class :</i>												
† Queenborough	Swan Hunter	1942	"	"	"	"	"	"	"	"	"	
† Quadrant	Hawthorn Lealle	"	"	"	"	"	"	"	"	"	"	
† Quailty	Swan Hunter	"	"	"	"	"	"	"	"	"	"	
† Quickmatch	White	"	"	"	"	"	"	"	"	"	"	
† Quiberon	"	"	"	"	"	"	"	"	"	"	"	

* Scourge, Scorpion and Serapis are with Netherlands Navy, and Stord with the Norwegian Navy.

† On loan to Royal Australian Navy. Quilliam of this class is now H. Neth M.S. Banckert.

Great Britain—DESTROYERS.

Name or Number	Built by	Com- pleted	Dimensions			Number of screws	Standard displacement	Horse- power	Mean speed on trial, or ex- pected	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
Pakenham Class :												
Paladin	Brown	1941-	Feet	Feet	Feet	2	Tons	..	Knots	4 4-in.	8	
Penn	Vickers (Walker)	42	345	35	9		1540	..	..	1 m.p.p.	21"	(Q)
Petard	" "											
*Onslow Class :												
Obdurate	Denny	1941-	"	"	"	"	"	..	..	4-in. or	8	
Obedient	Denny	42	"	"	"	"	"	..	..	4'7-in.	21"	(Q)
Onslaught	Fairfield									1 m.p.p.		
Opportune	Thornycroft											
Orwell	Thornycroft											
Napier Class :												
Napier (Ldr.)	Fairfield	1940	356	35½	"	"	1760	40,000	36	6 4'7-in.	21"	
Nepal	Thornycroft	1942								1 m.p.p.		
Nizam	J. Brown	1941										
Norman	Thornycroft	"										
Noble (ex-Piorun)	J. Brown	1940										
Milne Class :												
Milne (Ldr.)	Scotts	1942	362	37	10	2	1935	48,000	36.0	6 4'7-in.,	8	
Marne	Vickers	1941					1920			1 4-in.	21"	
Matchless	Stephen	1942					"			A.A.		
Meteor	"	"					"			1 m.p.p.		
Musketeer	Fairfield	"					"					
Eclipse Class :												
†Navarinon (ex-Echo)	Denny	1936	329	33½	8½	2	1375	36,000	36	3 4'7 in.,	4	145
										6 smaller	21"	
Beagle Class :												
†Salamis (ex-Boreas)	Palmer	1931	323	32½	8½	2	1360	34,000	35½	3 4'7 in.,	4	140
										6 smaller	21"	
Hunt Class :												
†Aegean (ex-Lauder- dale)	Thornycroft	1941	280	31½	8	2	1000	19,000	27½	4 4-in.	21"	..
†Adrias (ex-Tanat- side)	Yarrow	1942								4 4-in.		
Atherstone	Cammell Laird	1940								1 m.p.p.		
Albrighton	Brown											
Avon Vale	Brown	1941										
Beaufort	Cammell Laird	1941										
Belvoir	Cammell Laird	1942										
Bedale	Hawthorn Leslie	1942										
Bicester	Hawthorn Leslie	1942										
Blackmore	Stephen	1942										
Blankney	Brown	1941										
Bleasdale	Vickers-Armstrong	1942										
Blencathra	Cammell Laird	1940										
Brecon	Thornycroft	1942	296	33	8	2	1175	19,500	27	6 4-in. H.A.	21"	
Brissenden	Thornycroft	1941	296	33	8	2	1175	19,500	27	1 m.p.p.		
Brocklesby	Cammell Laird	1943	280	31½	8	2	1000	19,000	27½	4 4-in. H.A.		
Calpe	Swan Hunter	1941								1 m.p.p.		
†Admiral Hastings (ex Catterick)	Vickers-Armstrong	1942										
Cattistock	Yarrow	1940										
Chiddingfold	Scotts	1940										
Cleveland	Yarrow	1940										
Cotswold	Yarrow	1940										
Cottesmore	Yarrow	1940										
Cowdray	Scotts	1942										
†Crete (ex-Hurley)	Swan Hunter	1942										
Croome	Stephen	1941										
Easton	White	1942										
Eglinton	Vickers-Armstrong	1940										
Edgeford	White	1943										
Exmoor (ex-Bur- ton)	Swan Hunter	1941										
Farndale	Swan Hunter	1941										
Ferne	Brown	1940										
Garth	Brown	1940										
Hambleton	Swan Hunter	1940										
Haydon	Vickers-Armstrong	1942										
Holderness	Swan Hunter	1940										
†Kanara (ex- Hatherleigh)	Vickers-Armstrong	1942										

* Oriol of this class is now the Turkish Gayret. Onslow and Offa to Pakistan.

† On loan to Royal Hellenic Navy.

Great Britain—DESTROYERS.

Name or Number	Built by	Com- pleted	Dimenals			Number of screws	Standard displacement	Horse- power	Mean speed on trial, or ex- pected	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
<i>Hunt Class—contd.</i>												
Lamerton	Swan Hunter	1941	Feet 280	Feet 31½	Feet 8	2	Tons 1000	19,000	Knots 27½	4 4-in. H.A., 1 m.p.p.	21"	
Ledbury	Thornycroft	1942										
Mendip	Swan Hunter	1940										
Melbreak	Swan Hunter	1942										
Meynell	Swan Hunter	1940										
† Misoules (ex- Modbury)	Swan Hunter	1942										
Middleton	Vickers-Armstrong	1942										
Oakley (ex-Tick- ham)	Yarrow	1942										
† Pindos (ex-Bole- broke)	Swan Hunter	1942										
Pytchley	Scotts	1940										
Quantock	Scotts	1941										
Silverton	White	1941										
Southdown	White	1940										
Stevenstone	White	1943										
Talybont	White	1943										
Tetcott	White	1941										
† Themistocles (ex- Bramham)	Stephen	1942										
Whaddon	Stephen	1941										
Wheatland	Yarrow	1941										
Wilton	Yarrow	1942										
Zetland	Yarrow	1942										

† On loan to Royal Hellenic Navy.

Great Britain—SUBMARINES.

Name or number	Where built	Completed	Dimensions			No. of screws	Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
			Feet	Feet	Feet		Tons		Knots			
A Class :							1120					
Amphion	Vickers (Barrow)	1945					1600			1 4-in., 1 20-mm., 3 machine gns.		
Astute	"	"										
Auriga	"	1946										
Affray	Cammell Laird	"										
Aeneas	"	"										
Alaric	"	"										
Aicde	"	"										
Alderney	"	"										
Aurochs	"	"										
Artemis	Scots	1947										
Artful	"	1948										
Ambush	Vickers (Barrow)	1947										
Alliance	"	1947										
Anchorite	"	1947										
Andrew	"	1948										
Acheron	Chatham	1948										
Triton Class :												
Talent	Vickers (Barrow)	1945	275	26½	12	2	1090	2500	15½	1 4-in., 1 smaller	21"	53
Zeebond	"	"					1575	1450	9			
(<i>ex-Tapir</i>)												
Tacturn	"	1944										
Trump	"	"										
Tiptoe	"	"										
Thorough	"	"										
Telemachus	"	1943										
Tantivy	"	"										
Tantalus	"	"										
Truncheon	Devonport	1945										
Totem	"	"										
Thule	"	1944										
Tudor	"	"										
Tireless	Portsmouth	1945										
Turpin	Chatham	"										
Trenchant	"	1944										
Tradewind	"	1943										
Tallyho	Vickers (Barrow)	"										
Templar	"	"										
Truculent	"	"										
Tactician	"	1942										
Dolfin	"	"										
(<i>ex-Taurus</i>)												
Trespasser	"	"										
Token	Portsmouth	1945										
Tabard	Scott	1946										
Thermopylae	Chatham	1946										
Teredo	Vickers (Barrow)	1946										
*1940 "S" Class :												
Sentinel	Scott	1946	215	24	10½	2	670	1550	13½	1 3-in., 1 smaller	21"	48
Seneschal	"	1945					960	1330	9			
Seadevil	"	"										
Scotsman	"	"										
Springer	Cammell Laird	1945										
Sanguine	"	"										
Scorchers	"	"										
Sidon	"	1944										
Sleuth	"	"										
Solent	"	"										
Selene	"	"										
Seascout	"	"										
Supreme	"	"										
Subtle	"	"										
Stygian	"	"										
Sturdy	"	1943										
Statesman	"	"										
Spirit	"	"										
Storm	"	"										
Stole	"	"										
Surf	"	"										
Scythian	Scott	1944										
Spark	"	"										

* Eight "S" Class S/M.'s have been converted for experimental purposes. Others are to be used for trials.

Great Britain—SUBMARINES.

Name or number	Where built	Completed	Dimensions			No. of screws	Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
1940 "S" Class— contd.			Feet	Feet	Feet		Tons		Knots			
<i>Spiteful</i>	Scott	1943	215	24	10½	2	$\frac{670}{960}$	$\frac{1550}{1330}$	$\frac{13\frac{1}{2}}{9}$	1 3-in., 1 smaller	21"	48
<i>Sirdar</i>	"	"										
<i>Sea Rover</i>	"	"										
<i>Sceptre</i>	"	"										
<i>Satyr</i>	"	"										
<i>Shallmar</i>	Chatham	1944										
<i>Sportaman</i>	"	1943										
<i>Seraph</i>	Cammell Laird	1942										
Unity Class :												
<i>Vagabond</i>	Vickers (Walker)	1945	196	16	13	2	$\frac{540}{730}$	$\frac{615}{825}$	$\frac{11\frac{1}{2}}{9}$	1 3-in., 3 smaller	4-6 21"	27
* <i>Triaina (ex-Volatile)</i>	Vickers (Barrow)	1944										
* <i>Delphin</i>	Vickers (Barrow)	"										
* <i>Argonaftis (ex-Virulent)</i>	Vickers (Walker)	"										
<i>Vineyard</i>	Vickers (Barrow)	"										
<i>Urtica</i>	"	"										
<i>Upshot</i>	"	"										
<i>Vaisgoth</i>	"	"										
<i>Vigorous</i>	"	"										
<i>Vampire</i>	"	1943										
* <i>Pipinos</i>	"	"										
<i>Vivid</i>	Vickers (Walker)	1944										
<i>Unswerving</i>	"	1943										
<i>Uther</i>	"	"										
<i>Varangian</i>	"	"										
* <i>Xifias</i>	"	"										
* <i>Amfitriti</i>	Vickers (Barrow)	"										
<i>P.67 (ex-LeCurie)</i>	"	"										
<i>Unseen</i>	"	1942										
<i>Unbending</i>	"	1941										
<i>Una</i>	Chatham	"										
<i>Ultimatum</i>	Vickers	"										
<i>P.97 (ex-Sokol)</i>	"	"										

* On loan to Royal Hellenic Navy.

Vessels of the Unity Class are serving with the Greek, Norwegian, and Danish navies.

Great Britain—SLOOPS, FRIGATES, &C.

Name	Dis- place- ment	Length (extreme)	Beam (ex- treme)	Draught	Horse- power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
SLOOPS—	tons	ft. in.	ft. in.	ft. in.								
<i>Modified Black Swan Class :</i>												
Actaeon	1400	299 6	38 6	9 0	4300 P.T. (G.)	Thornycroft Denny	Thornycroft Denny	1945 1946	1946 1945	6 4-in., 10 smaller	19½	..
Alacrity						A. Stephen	A. Stephen	1943 1943	1943 1943			
Amethyst						Denny	Denny	1942 1943	1942 1943			
Crane						C. Laird	C. Laird	1942 1942	1942 1942			
Cygnets						A. Stephen	A. Stephen	1943 1943	1943 1943			
Hart						Denny	Denny	1943 1944	1943 1944			
Hind						Chatham	Yarrow	1944 1945	1944 1945			
Modeste						Denny	Denny	1944 1945	1944 1945			
Opossum						Thornycroft	Thornycroft	1943 1943	1943 1943			
Magpie						Denny	Denny	1943 1944	1943 1944			
Mermaid						Chatham	Yarrow	1944 1946	1944 1946			
Nereide						Thornycroft	Thornycroft	1943 1944	1943 1944			
Peacock						Yarrow	Yarrow	1942 1943	1942 1943			
Pheasant						Yarrow	Yarrow	1943 1943	1943 1943			
Redpole						Denny	Denny	1945 1946	1945 1946			
Snipe						Denny	Denny	1946 1947	1946 1947			
Sparrow						Fairfield	Fairfield	1942 1943	1942 1943			
Starling						Yarrow	Yarrow	1942 1943	1942 1943			
Whimbrel						Yarrow	Yarrow	1942 1943	1942 1943			
Wild Goose						Fairfield	Fairfield	1942 1943	1942 1943			
Woodcock						Denny	Denny	1942 1943	1942 1943			
Wren												
<i>Black Swan Class :</i>												
Black Swan	1300	299 6	37 6	9 0	4300 P.T. (G.)	Yarrow Furness	Yarrow	1939 1940	1940 1941	6 4-in., 10 smaller	19½	..
Erne						Yarrow	R. Westgarth	1939 1939	1939 1939			
Flamingo												
<i>Egret Class :</i>												
Pelican	1250	292 0	37 6	8 4	3600 P.T. (G.)	Thornycroft	Thornycroft	1938 1939	1938 1939	6 4-in., 10 smaller	19½	188
<i>Bittern Class :</i>												
Stork	1100	282 0	37 0	8 6	3300 P.T. (G.)	Denny	Denny	1936 1936	1936 1936	6 4-in., 3 smaller	18½	125
<i>Grimsby Class :</i>												
Aberdeen	990	266 0	36 0	7 6	2000 P.T. (G.)	Devonport	Thornycroft	1936 1936	1936 1936	2 4-in., 6 smaller	16½	100
Fleetwood						Devonport	Thornycroft	1936 1936	1936 1936	4 4-in., 1 smaller	16½	100
<i>Repeat Shoreham Class :</i>												
Falmouth	1060	281 4	35 0	8 3	2000 P.T. (G.)	Devonport	H. Leslie	1932 1932	1932 1932	2 4-in. H.A., 4 smaller	16½	100
<i>Shoreham Class :</i>												
Bideford	1105	281 4	35 0	8 3	2000 (G.)	Devonport	J. S. White	1931 1931	1931 1932	2 4-in. H.A., 6 smaller	16½	100
Rochester						Chatham	J. S. White					
<i>Hastings Class :</i>												
Scarborough	1045	266 4	34 1	9 1	2000 P.T. (G.)	Swan Hunter	H. Leslie	1930 1930	1930 1930	2 4-in.	16½	100
FRIGATES—												
<i>Bay Class :</i>												
Cawsand Bay	1600	307 0	38 9		5500	Blyth Dry Dk.	J. S. White	1945 1945	1945 1945	4 4-in., 10 smaller	19½	..
Enard Bay						Smiths Dock	Smiths Dock	1944 1946	1944 1946			
Largo Bay						Pickersgill	Geo. Clark	1944 1946	1944 1946			
Tremadoc Bay						Harland & Wolff	Harland & Wolff	1945 1945	1945 1945			
Padstow Bay						Henry Robb	Henry Robb	1945 1946	1945 1946			
Porlock Bay						Chas. Hill	Chas. Hill	1945 1946	1945 1946			
Wigtown Bay						Harland & Wolff	Harland & Wolff	1945 1946	1945 1946			
Carnarvon Bay						Henry Robb	Henry Robb	1945 1945	1945 1945			
Burghead Bay						Chas. Hill	Chas. Hill	1945 1945	1945 1945			
Start Bay						Harland & W.	Harland & W.	1945 1945	1945 1945			
Whitesand Bay						Harland & W.	Harland & W.	1945 1945	1945 1945			
Bigbury Bay						Harland & W.	Harland & W.	1944 1945	1944 1945			
Cardigan Bay						Hall Russell	Hall Russell	1944 1945	1944 1945			
St. Brides Bay						Henry Robb	Henry Robb	1944 1945	1944 1945			

Great Britain—continued.

Name	Dis- place- ment	Length (extreme)	Beam (ex- treme)	Draught	Horse- power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
FRIGATES (cont.)	tons	ft. in.	ft. in.	ft. in.								
<i>Bay Class—</i>												
—contd—												
St. Austell Bay	1600	307 0	38 9		5500	Harland & W. Chas. Hill	Harland & W. Chas. Hill	1945 1945	1945 1945	4 4-in., 10 smaller	19½	..
Veryan Bay						Harland & W.	Harland & W.	1944 1944	1944 1945			
Widemouth Bay												
<i>Loch Class :</i>												
Loch Alvie	1445	307 0	38 6	..	6500	Barclay Curle Chas. Hill	Barclay Curle Chas. Hill	1944 1944	1944 1944	1 4-in., 10 smaller	19½	..
Loch Dunvegan						John Brown Burntisland Chas. Hill	John Brown David Rowan Chas. Hill	1943 1944	1943 1944			
Loch Fada												
Loch Killin												
Loch Ruthven						Henry Robb Harland & W. Burntisland	Henry Robb Harland & W. David Rowan Chas. Hill	1944 1944	1944 1944			
Loch Insh												
Loch Craggie												
Loch Fyne						Caledon S.B. Co.	Caledon S.B. Co.	1944 1944	1944 1944			
Loch Lomond						Harland & W. Chas. Hill	Harland & W. Chas. Hill	1944 1944	1944 1944			
Loch Gorm						Blyth Dry Dks	J. S. White	1944 1944	1944 1945			
Loch Seavaig						Alisa S.B. Co.	Alisa S.B. Co.	1944 1944	1944 1945			
Loch Quoich						Burntisland	David Rowan	1944 1944	1944 1945			
Loch Tarbert						Caledon S.B. Co.	Caledon S.B. Co.	1944 1944	1944 1945			
Loch Glendhu												
Loch More						"	"	1945 1945	1944 1945			
Loch Tralraig						Harland & W.	Harland & W.	1944 1944	1944 1945			
Loch Killisport												
Loch Arkaig						Caledon	Caledon	1945 1945	1945 1945			
Loch Veyatie						Alisa S.B. Co.	Alisa S.B. Co.	1945 1945	1946 1946			
<i>* River Class :</i>												
Ballinderry	1445	303 0	36 6	12 0	6500 (R) some T.G.	Blyth Dry Dk.	Hawthorne Leslie	1942 1943	1943 1943	2 4-in., 8 smaller	20	14
Chelmer						Geo. Brown	C. A. Parsons	1943 1943	1943 1943			
Dart						Blyth Dry Dk.	Hawthorne Leslie	1943 1943	1943 1943			
Derg						Henry Robb	Henry Robb	1943 1943	1943 1944			
Dovey						Fleming & Ferguson	Fleming & Ferguson	1943 1944	1943 1944			
Ettrick						J. A. Crown	C. A. Parsons	1943 1943	1942 1942			
Exe						Fleming & Ferguson	Fleming & Ferguson	1942 1942	1942 1942			
Halladale						A. & J. Inglis	C. A. Parsons	1944 1944	1943 1943			
Helford						Hall Russell	Hall Russell	1943 1943	1943 1943			
Helmsdale						A. & J. Inglis	C. A. Parsons	1942 1943	1942 1943			
Jed						Chas. Hill	Chas. Hill	1942 1942	1942 1942			
Kale						A. & J. Inglis	Hawthorne Leslie	1942 1942	1942 1942			
Lochy						Hall Russell	Hall Russell	1942 1942	1942 1942			
Meon												
Nene						Smiths Dock	Smiths Dock	1942 1943	1942 1943			
Nith						Henry Robb	Henry Robb	1942 1942	1942 1942			
Ness						Henry Robb	Henry Robb	1942 1942	1942 1942			
Odzani						Smith's Dock Co.	Smiths Dock Co.	1943 1943	1943 1943			
Plym												
Ribble						Blyth Dry Dk.	Geo. Clark	1943 1944	1943 1944			
Rother						Smiths Dock	Smiths Dock	1941 1942	1941 1942			
Spey						Smith's Dock	Smith's Dock	1941 1941	1941 1941			
Swale												
Taff						Chas. Hill	Chas. Hill	1943 1944	1942 1942			
Tay						Smiths Dock	Smiths Dock	1942 1942	1942 1942			
Tavy						Chas. Hill	Chas. Hill	1943 1943	1943 1943			
Tees						Hall Russell	Hall Russell	1943 1943	1942 1942			
Test						"	"	1942 1942	1942 1942			
Teviot						"	"	1942 1943	1943 1943			
Towy						Smiths Dock	Smiths Dock	1943 1943	1943 1943			
Uak						"	"	1943 1943	1942 1942			
Waveney						"	"	1942 1942	1942 1942			
Wear						"	"	1942 1942	1942 1942			
Wye						Henry Robb	Henry Robb	1942 1943	1942 1943			

* Vessels of this class in service with R.A.N., R.C.N., R.I.N., S.A.N.F., French, and Danish and Burmese, Navies.

Great Britain—continued.

Name	Dis- place- ment	Length (extreme)	Beam (ex- treme)	Draught	Horse- power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
FRIGATES (cont.)	tons	ft. in.	ft. in.	ft. in.								
<i>Castle Class :</i>												
Allington Castle	1100	252 0	36 8	..	2880 (R)	Fleming & Ferguson Geo. Brown	Fleming & Ferguson Kinkaid	1944	1944	1 4-in. several smaller	18½	..
Alnwick Castle						Geo. Brown	Geo. Brown	1944	1944			
Amberley Castle						S. P. Austin	Geo. Clark	1943	1944			
Bamborough Castle						John Lewis	John Lewis	1944	1944			
Berkeley Castle						Barclay Curle	Barclay Curle	1943	1943			
Calstoe Castle						John Lewis	John Lewis	1944	1944			
Carlisle Castle						Caledon S.B. Co.	Caledon S.B. Co.	1943	1943			
Dumbarton Castle						"	"	1943	1944			
Farnham Castle						John Crown	Geo. Clark	1944	1945			
Flint Castle						Henry Robb	Henry Robb	1943	1943			
Hadleigh Castle						Smiths Dock Co.	Smiths Dock Co.	1943	1943			
Heddingham Castle						John Crown	Geo. Clark	1944	1945			
Kenilworth Castle						Smiths Dock Co.	Smiths Dock Co.	1943	1943			
Knarborough Castle						Blyth Dry Dk.	J. S. White	1943	1944			
Lancaster Castle						Fleming & Ferguson	Fleming & Ferguson	1944	1944			
Launceston Castle						Blyth Dry Dk.	J. S. White	1943	1944			
Leeds Castle						Wm. Pickers-gill	Geo. Clark	1943	1944			
Morpeth Castle						"	"	1943	1944			
Oakham Castle						A. & J. Inglis	Harland & W.	1944	1944			
Oxford Castle						Harland & W.	"	1943	1944			
Pevensy Castle						"	"	1944	1944			
Portchester Castle						Swan Hunter	Swan Hunter	1943	1943			
Rushen Castle						"	"	1943	1944			
Tintagel Castle						Alls S.B. Co.	Alls S.B. Co.	1943	1944			
CORVETTES—												
<i>* Flower Class :</i>												
Arbutus	1060	205 0	33 2	13 6	2750	G. Brown	Geo. Clark	1943	1944	1 4-in., 4 smaller	16	85
Arabis						C. Hill	Geo. Clark	1942	1943			
Meadowsweet								1942	1942			
MINESWEEPERS												
<i>Algerine Class :</i>												
Albacore	950	225 0	35 6	10 6	2000	Harland & W. Lobnitz	Harland & W. Lobnitz	1945	1945	1 4-in. H.A., 8 20-mm. (some have 40-mm. also)	16½	..
Bramble						Harland & W. Lobnitz	Harland & W. Lobnitz	1944	1944			
Chameleon						"	"	1944	1944			
Cheerful						Fleming & F. Redfern	Fleming & F. Redfern	1942	1943			
Cockatrice						"	"	1943	1944			
Coquette						"	"	1943	1944			
Courier						Harland & W. Lobnitz	Harland & W. Lobnitz	1942	1942			
Esplégle						Blyth Dry Dks	J. S. White	1943	1943			
Fancy						"	"	1945	1945			
Fierce						"	"	1942	1942			
Fly						"	"	1944	1944			
Flying Fish						Redfern	Montreal Loco	1944	1944			
Golden Fleece						"	"	1944	1944			
Hare						Harland & W. Lobnitz	Harland & W. Lobnitz	1944	1944			
Hound						"	"	1942	1942			
Jaseur						Redfern	"	1944	1944			
Laertes						"	"	1945	1945			
Lennox						Lobnitz	Lobnitz	1943	1944			
Lioness						Redfern	Montreal Loco	1944	1944			

* Vessels of this class are serving with the R.C.N., R.N.Z.N., R.I.N., and the Greek, French, Norwegian, Chinese and Eireann navies.

Great Britain—continued.

Name	Dis- place- ment	Length (extreme)	Beam (ex- treme)	Draught	Horse- power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
MINESWEEPERS	tons	ft. in.	ft. in.	ft. in.								
—contd.												
<i>Algerine Class</i>												
—contd.												
Lysander	950	225 0	35 6	10 6	2000	Port Arthur	Montreal Loco	1943	1944	1 4-in. H.A., 8 to 12 20-mm. (some have 40-mm. also)
Magicienne						Redfern	"	1944	1945			
Maenad						"	"	1944	1944			
Mameluke						"	"	1944	1945			
Mandate						"	"	1944	1945			
Mariner						Port Arthur	Montreal Loco	1944	1945			
Marmion						Redfern	"	1944	1945			
Marvel						"	"	1944	1945			
Mary Rose						"	Montreal Loco	1943	1944			
Michael						"	"	1944	1945			
Moon						"	Montreal Loco	1944	1945			
Myrmidon						"	"	1942	1943			
Mystic						"	"	1944	1945			
Nerissa						"	"	1944	1945			
Niger						Lobnitz	Lobnitz	1944	1945			
Octavia						Redfern	Montreal Loco	1945	1945			
Onyx						Harland & W.	Harland & W.	1942	1943			
Orcadia						Port Arthur	"	1944	1945			
Orestes						Lobnitz	Lobnitz	1942	1943			
Oswery						Port Arthur	"	1944	1945			
Pickle						Harland & W.	Harland & W.	1943	1943			
Pincher						"	"	1943	1943			
Pucky						"	"	1943	1943			
Pinto						Port Arthur	"	1944	1945			
Polaris						"	"	1944	1945			
Providence						Redfern	Montreal Loco.	1943	1944			
Pyrrhus						Port Arthur	"	1945	1945			
Ready						Harland & W.	Harland & W.	1943	1943			
Recruit						"	"	1943	1944			
Rifleman						"	"	1943	1944			
Rinaldo						"	"	1943	1943			
Romola						Collingwood	"	1944	1945			
Rosaria						Harland & W.	Harland & W.	1943	1943			
Rowna						Lobnitz	Lobnitz	1944	1944			
Seabear						Redfern	Montreal Loco.	1943	1944			
Serene						"	"	1943	1944			
Skipjack						"	"	1943	1944			
Spanker						Harland & W.	Harland & W.	1943	1943			
Stormcloud						Lobnitz	Lobnitz	1943	1944			
Sylvia						"	"	1944	1944			
Tanganyika						"	"	1944	1944			
Thlebe						Redfern	Montreal Loco.	1943	1944			
Truelove						"	"	1943	1944			
Wave						Lobnitz	Lobnitz	1944	1944			
Welcome						"	"	1944	1945			
Waterwitch						"	"	1943	1943			
Welfare						Redfern	Montreal Loco.	1943	1944			
<i>Bangor Class :</i>												
Fort York	600–	170–	28 6	9 6	2000	Dufferin	Montreal Loco.	1941	1942	1 3-in. H.A., several smaller	16½	..
Romney	700	180 0			P.T.	Lobnitz	Lobnitz	1940	1940			
Rothsay					(G.)	Hamilton	J. S. White	1941	1941			
Sidmouth					or	H. Robb	Plenty	1941	1941			
Poiruan					2400 R.	Alla	Alla	1940	1941			
<i>Halcyon Class :</i>												
Gleaner	815	245 0	33 6	7 6	1750 P.T.	W. Gray	Central Marine	1937	1938	1 4-in., several smaller	17	80
*Seagull						Devonport	Richardsons	1937	1938			
*Sharpshooter						Devonport	J. S. White	1936	1937			
Halcyon					1770	J. Brown	J. Brown	1933	1934			
Harrier					R.	Thornycroft	Thornycroft	1934	1934			
RIVER GUN- BOATS—												
Locust	585	197 0	33 8	5 0	3800 P.T. (G.) 2000 recip.	Yarrow	Yarrow	1939	1940	2 4-in., many smaller	17	..

* Converted to survey ships.

GREAT BRITAIN.—MISCELLANEOUS CRAFT.

- DESTROYER DEPOT SHIPS.**—Woolwich (1835), 8,750 tons, 15 knots, 4 4-in. A.A.; Tyne (1941), 11,000 tons, 8 4.5-in. A.A., 2 2-pr. m.p.p., 7,500 S.H.P., 17 knots, 20,000 tons, 4 4-in.
- SUBMARINE DEPOT SHIPS.**—Maidstone (1838) and Forth (1939), 8,900 tons, 17 knots, 8 4.5-in., 4 3-pr.; Adamant, 12,500 tons, 17 knots, 8 4.5-in.; Wolfe (1943), 4 4-in.; Montclare (1945), 18,200 tons, 12 20-mm.
- HEAVY REPAIR SHIPS.**—Resource (Vickers', 1930), 12,300 tons, 15 knots, armament 4 4-in. A.A.; Artifex, Ausonia, Alauda (1944-45), 19,000 tons, 12-20 20-mm.; Ranpura (1945), 18,200 tons, 12 20-mm.
- MIXELAYERS.**—Manxman (1941), Ariadne (1943), Apollo (1944), 2,650 tons, 40 knots, 6 4-in. Stonechat, Blackbird, Redshank, Ringdove, Plover, 500-800 tons. Miner I-VIII 815 tons, 17 knots, 1 4-in. Dampier, Dalrymple, Cook, Owen (Ex-Loch Class Frigates).
- NON-MAGNETIC SURVEY VESSEL.**—Research, building by Philip at Dartmouth. Sailing vessel.
- NETLAYER AND TARGET TOWING VESSELS.**—Guardian (Chatham, 1831-3), 2,860 tons, 6,500 H.P., 18 knots, 2 4-in. A.A.; Protector (1834 programme), 2,900 tons, 20 knots, 1 4-in. Boom Defence Vessels.—Bayonet Class (1939), 10 in number, 600 tons, 11 knots, 1 3-in.; Barricade Class (1938-45), 65 in number, 750 tons, 12 knots, 1 3-in.
- TRAWLERS.**—Professor Class (10), 400 tons, 500 H.P.; Round Table Class (6), 440 tons, 360 H.P. (D.); Mersey Class (1918), (6), 500 tons; Military Class (9), 800 tons, 1,000 H.P. (R.); Fish Class (7), 600 tons, 700 H.P. (R); Hill Class (6), 750 tons, 970 H.P. (R.); Isles Class (130); Dance Class (20); Shakespeare Class (8), and Tree Class (20), 550 tons, 850 H.P. (R.) 12 knots.
- MOTOR TORPEDO BOATS.**—About 200 in number, 35-45 tons, 2 18-in. or 21-in. torpedoes. About 150 in number, 100 tons, 2 21-in. torpedoes.
- STREAM GUN BOATS.**—6 in number, 200 tons.
- MOTOR LAUNCHES.**—A large number, 110 ft., 18 knots and 72 ft., 12 knots.
- MOTOR MINESWEEPERS.**—40 in number, 126 ft., 350 tons, 10 knots. 150 in number, 105 ft., 250 tons, 12 knots. About 100 B.Y.M.S., 300 tons, 1 3-in. gun.
- MONITORS.**—Roberts, Abercrombie, 8,000 tons, 2 15-in., 8 4-in., 12 knots.
- HOSPITAL SHIPS.**—Maine (Ex-Empire Clyde), 12,200 tons, 14 knots.
- STORE SHIPS.**—Robert Dundas, Robert Middleton, Bacchus, Reliant.
- OIL TANKERS.**—Olna, Wave Regent, Wave Governor, Wave Emperor, Wave Monarch, Wave King, Empire Salvage (1941-5), 16,000-20,000 tons. Abbeydale, Armdale, Bishop Dale, Boardale, Cedardale, Derwentdale, Dewdale, Dingledale, Eagledale, Easedale, Echodale, Ennerdale (1937-39), 11,500 tons D.W., 11½ knots. Olcades, Oligharch Olwen and Olynthus, 9,000 tons D.W., 10½ knots. War Afridi, War Bharata, War Brahmin, War Hindoo, War Krishna, War Nizam, War Pathan, War Pindari, War Sudra, 7,000 tons D.W., 11 knots. Appleleaf, Brambleleaf, Cherryleaf, Orangeleaf, Pearleaf (1917), 5,000 tons D.W., 15 knots. Belgol, Calerol, Mixol, Prestol, Rapidol, Serbol, Thermol (1917), 2,000 tons D.W., 13½ knots. Borxol, Distol, Eldorol, Elmol, Hickorol, Kimmerol, Larchol, Limol, Philol, Scotol, Viscol (1917), 1,000 tons D.W., 9 knots.
- LANDING SHIPS.**—(Dock) 4 in number; (Emergency Repairs) 5 in number; (Fighter Direction) 1 in number; (Stern Chute) 1 in number; (Tank) about 100 in number.
- AIRCRAFT REPAIR AND MAINTENANCE SHIPS.**—Unicorn (1943), 15,000 tons, 8 4-in., many smaller. Perseus, Pioneer (1945), 14,000 tons, many 20-mm. Holm Sound.
- MAINTENANCE SHIPS.**—Berry Head, Rame Head, Duncanby Head, Portland Bill, Cape Wrath, Derby Haven, Mull of Galloway.
- DESPATCH VESSELS.**—Alert (Ex-Dundrum Bay), Surprise (Ex-Gerrans Bay) (1946), 1,600 tons, 19½ knots, 2 4-in., 4 3-pr.

ROYAL AUSTRALIAN NAVY.

AIRCRAFT CARRIER AND CRUISERS

Class	NAME	Stand- ard dis- place- ment	Length (ex- treme)	Beam (ex- treme)	Draught	Horse- power, type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of com- pletion	Cost	Armour		Armament		Com- ple- ment Speed (war)
												Belt	Gun posi- tion	Guns	Tor- pedo tubes	
Majestic Class	Sydney (ex-Terrible)	14,000 tons	ft. 693	ft. in. 112 max.	ft. in. 21 4	40,000	Devonport	Parsons	1944	1948	£	in.	in.	4 3-pr., 30 40-mm., 40 aircraft.		knots 25
Kent Class	Australia	9870	630	66 4 F.D.	16 3	80,000	Brown	Brown	1927	1928				8 8-in., 8 4-in. A.A., 4 2-pr. m.p.p., 4 m., 12 L.	8 21"	31½
London Class	—	9830	633	66 0	17 0	B.C. (G.) Y.	Dalmuir	Beardmore	1928	1929	1,941,960				a.w. (Q.)	32½
Modified Leander Class	Hobart —	7000	562	56 8	15 8	73,000 P.T. (G.)	Devonport	Beardmore	1934	1936	1,459,117			8 6-in., 8 4-in. A.A., 18 smaller.	8 21" (Q.)	33½

DESTROYERS.—*Tribal Class* (1940-44): Arunta, Bataan, Warramunga, 1,930 tons, 34 knots on 44,000 S.H.P., 6 4-7-in., 2 4-in., 6 40-mm., 4 21-in. T.T. Built at Cockatoo Docks.

Quilliam Class (1942): Quickmatch, Quiberon, Queensland, Quality, Quadrant, 1,700 tons, 34 knots on 40,000 S.H.P., 4 2-pr., 4 40-mm., 8 21-in. T.T.

Battle Class (Bldg.): Tobruk, Anzac, Cockatoo and Williamstown Dockyard respectively. 2,400 tons, 5 4-5-in., 8 40-mm., 10 21-in. T.T., 34 knots on 50,000 S.H.P.

Daring Class (Bldg.): 2 at Cockatoo, 2 at Williamstown, 2,620 tons, 6 4-5-in., 10 40-mm., 10 21-in. T.T.

Stoors.—Warrego (1940), Swan (1936), 1,060 tons, 16½ knots, 3 4-in., 1 m.m., Moresby (1918), 1,650 tons, 1 12-pr.

FRIGATES.—River Class, Barcoo, Gascoyne, Burdekin, Hawkesbury (1943), 1,445 tons, 20 knots, 2 4-in.; Diamantina, Lachlan, Barwon (1944), Murchison, Maguare (1945), 1,440 tons, 20 knots, 2 4-in.; Culgoa, Shoalhaven, Condamine (1946), 1,544 tons, 20 knots, 4 4-in., 40 m.m. (All Australian built.)

MINESWEEPERS.—Bathurst Class: Ararat, Ballarat, Bathurst, Renalla, Bendigo, Bowen, Bunbury, Bundaberg, Burnie, Cairns, Castlemaine, Casenock, Colac, Cootamundra, Cowra, Deloraine, Dubbo, Echuca, Fremantle, Glenelg, Goulburn, Gympie, Horsburn, Inverell, Ipswich, Junee, Kalgoolie, Kapunda, Katoomba, Kiama, Latrobe, Lismore, Lithgow, Maryborough, Mildura, Parkes, Rockhampton, Shepparton, Stawell, Strahan, Tanworth, Towoomba, Townsville, Wagga, Whyalla, Woollongong (1940-43), 650-700 tons, 16 knots, 1 4-in., 3 or 3 Oerlikon.

MOTOR LAUNCHES.—Fairmile Type, 36 in number. 5 others.

ROOM DEFENCE VESSELS.—Koala and Kangaroo (1940), 770 tons, 11 knots, 1 12-pr.; Kookaburra (1939), 577 tons, 9½ knots, 1 12-pr., Karangi.

DEPTO SHIP.—Penguin (1917), 3,455 tons, 14 knots, 1 4-in.

MINELAYERS.—Bungaree (1937), 3,155 tons gross, 11 knots, 2 4-in., 1 12-pr.

TUGS.—Tandred Sprightly (1942), 570 tons, 1 3-in.; Reserve (1942), 750 tons, 1 3-in.

† Serving with Royal Netherlands Navy.

ROYAL CANADIAN NAVY.

AIRCRAFT CARRIER AND CRUISERS.

Class	NAME	Stand- ard dis- place- ment	Length (ex- treme)	Beam (ex- treme)	Draught	Horse- power. Type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of com- ple- tion	Cost		Armour		Armament		Com- ple- ment
											£	in.	Belt Deck	Gun posi- tion	Guns	Tor- pedo tubes	
Majestic Class L.A.C.	Magnificent	14,000	695	112 0	28 4	40,000	Harland & Wolff	Harland & Wolff	1944	1948		in.		in.	4 3-in., 30 40-mm. A.A., 40 aircraft.		25
Uganda Class Cr.	Uganda	8000	555½	63 0	16 6	72,000 P.T.(G.)	Vickers (Walker)	Parsons	1941	1943					9 6-in., 8 4-in. A.A., 16 smaller.	6 21" (T)	32
Swiftsure Class Cr.	Ontario	"	"	63 0	"	"	Harland & Wolff	Harland & Wolff	1943	1945					9 6-in., 10 4-in. A.A.	"	"

DESTROYERS.—Crescent, Crusader (ex-R.N. Crescent Class); Sioux, Algonquin (ex-R.N. Valentine Class); Athabasca, Cayuga, Haida, Huron, Iriquois, Micmac, Nootka (Tribal design) (1941-48), 6 4.7-in., 2 4-in., 36.5 knots.

FRIGATES.—River Class (1942-44), 1,445 tons, 2 4-in., H.A., 20 knots; Antigonish, Beacomhill, Capilano, Hulloise, New Waterford, Orkney, St. Stephen, Swansea, Wentworth.

MINESWEEPERS.—*Algerine Class* (1943), 850 tons, 1 4-in., 4 Oerlikons; Fort Francis, Kapuskasing, New Liakard, Oshawa, Portage, Rockcliffe, Sault, Ste. Marie, Wallaceburg, Winnipeg.

Motor Minesweepers (1944), 120 feet, 10 knots; Llewellyn, Lloyd George, Revelstoke.

Sweeping Mine Trawlers.—Comox, Nandee, Gaspe and Fundy (1936), 668 tons, 12½ knots, 1 4-in.

ICEBREAKERS.—Ernest Lapointe (1941), 1,179 tons gross, 14 knots; Lady Grey (1906), 1,080 tons, 14 knots; M.B. McLean (1930), 5,000 tons, 15 knots. One Building.

TUGS.—Ocean Eagle (1919), 420 tons gross, 11½ knots.

OILERS.—Dundalk, Dundurn.

STORE CARRIERS.—Laymore, Eastmore.

CONTROLLED MINELAYERS.—Sackville (Flower Class Corvette), 1941, 1,060 tons, 16 knots, 1 4-in.; White Throat (1944), 580 tons.

SUBVEYING SHIP.—(Flower Class) (1941), Woodstock, 1,060 tons, 16 knots.

ROYAL INDIAN NAVY.

Class	NAME	Stand- ard dis- place- ment	Length (ex- treme)	Beam (ex- treme)	Draught machinery and boilers	Horse- power	Where built	Maker of engines	Date of launch	Date of com- ple- tion	Cost	Armour		Tor- pedo posi- tion	Com- ple- ment (war)
												Belt	Gun posi- tion		
Leader Class	Dulhi (ex-Achilles)	tons 7030	ft. in. 554 6	ft. in. 55 2	ft. in. 16 0	72,000 P.T. (G.)	Cammell Laird	Cammell Laird	1933	1933	£	in.	in.	8 21°	knots 33 680

DESTROYERS.—*Ex-R.N. Rotherham, Raider, Redoubt* (1942), 1,710 tons, 37 knots, 4 4-7 m.p.p. or twin 40-mm.

SLOOP.—*Wren Class* (1943), 1,400 tons, 19½ knots, 6 4-in. : Cauvery, Jumma, Kistna, Sutlej.

FRIGATES (1943), *River Class*, 1,445 tons, 20 knots, 2 4-in. A.A. : Tir, Kukri.

CORVETTES.—(*Flower Class*), 925 tons, 17 knots, 1 4-in. A.A., Assam, Mahatma.

MINESWEEPERS.—*Bangor Class* (1941-42), 672 tons, 16 knots, 1 4-in. A.A., 1 Oerlikon ; Bihar, Carnatic, Deccan, Khyber, Kontan, Kumson, Orissa, Rajputana, Rohikhand. A number

of Motor Minesweepers. *Bathurst Class*, 650-700 tons, 16 knots, 1 4-in. : Bengal, Bombay, Madras.

TRAWLERS.—(1941-42), *Amritsar, Calcutta, Cochin, Nasik.*

MOTOR TORPEDO BOATS AND MOTOR MINESWEEPERS.—Several.

MOTOR LAUNCHES.—A number of the Fairmile "B" type.

ROYAL PAKISTAN NAVY.

DESTROYERS.—*Ex-R.N. Onslow, Offa* (1941-42), 1,540 tons, 37 knots, 4 7-in. guns.

SLOOP.—*Wren Class* (1943), *Godavari, Narbada*, 1,400 tons, 19½ knots, 6 4-in.

FRIGATES.—*River Class* (1943), *Shamsher, Dhanush*, 1,445 tons, 20 knots, 2 4-in., 8 20-mm.

CORVETTE.—

TRAWLERS.—*Baroda, Rampur* (1941), 545 tons, 13-in.

MINESWEEPERS.—*Baluchistan, Kathiawar, Malwa, Oudh* (1942-44), 672 tons, 1 4-in. A.A., 1 40-mm., 2 20-mm., 16 knots.

MOTOR MINESWEEPERS.—Two.

MOTOR LAUNCHES.—Four.

ROYAL NEW ZEALAND NAVY.

CRUISERS.

Class	NAME	Stand- and dis- place- ment	Length (ex- treme)	Beam (ex- treme)	Draught	Horse- power. Type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of com- ple- tion	Cost	Armour		Armament		Com- ple- ment (war)
												Belt Deck	Gun posi- tion	Guns	Tor- pedo Speed tubes	
Dido Class	Bellona	tons 5450	ft. 506	ft. in. 50 5	ft. in. 14 0	62,000 P.T. (G.)	Fairfields	Fairfields	1942	1943	£	in.	in.	8 5-25-in., many 40- mm. A.A.	6 21" (T)	knots 33
	Black Prince	"	"	"	"	"	Harland & Wolff	Harland & Wolff	1942	1943						

FRIGATES.—(Loch Class) (1944), Hawea, Kariere, Pukaki, Taupo, Rototiti, Tutira, 1,445 tons, 19½ knots, 1 4-in., 10 smaller.

MOTOR LAUNCHES.—Fairmile Type, 12 in No., 16 others.

TRAWLERS.—Castle Class (1943), 5 in No.; Isle Class (1941), 4 in No.

FLEET TUG.—Toia, 570 tons, 12 knots.

SOUTH AFRICAN NAVAL FORCES.

FRIGATES.—Good Hope, Natal, Transvaal (Loch Class).

FLEET MINESWEEPERS.—Algerine Class, Maritzburg, Bloemfontein, 1,040 tons, 16 knots, 1 4-in., 4 40-mm.

SURVEYING VESSEL.—Protea, 1,020 tons, 16 knots.

CONTROLLED MINELAYER.—Spendthrift, 926 tons.

COAST DEFENCE.—Sarcoss, Barbrake (ex-R.N.).

Class	NAME	Standard Displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour					Armament		Speed	Fuel Oil	Com- ple- ment
											Belt	Deck	Side above belt head	Gun position	Guns	Torpedo tubes				
																	Heavy Guns				Secondary
b.	Moreno	tons 27,940	ft. 585	ft. 97½	ft. 28	45,000* C.T. (G.)	Camden, N.J. (N.Y.S.B. Co.)	1911	1915	£ 2,200,000	in. 12-10 K.S.	3-2	in. 9-6 K.S.	in. 12-9 K.S.	in. 12-9 K.S.	12 12-in., 12 6-in., 4 3-in. A.A., 1 7-85-in., 6 M.	2 (sub.) 21*	knots 22-5	tons 4200	1175
b.	Rivadavia	"	"	"	"	B. & W. (G.)	Quincy, Mass.	"	1914	"	"	"	"	"	"	9 6-in., 4 4-in. A.A., 2 3-in., 25 A.A. M.G., 1 catapult, 2 aircraft.	6 21*	"	"	"
cr.	La Argentina	6500	535	56½	16	54,000 P.T. (G.)	Vickers, Barrow	1937	1938	1,750,000 approx.	3	3	"	"	"	6 7-5-in., 12 4-in. A.A., 6 Pom Poms, 1 catapult, 2 sea-planes.	2 (T)	30	1000	556 + 60 Ctds.
cr.	Almirante Brown	6495	545½	58	16½	100,000 P.T. (G.)	Genoa	1929	1931	1,250,000	3	1	"	"	"	2 10-in., 8 4-7-in., 4 6-pr., 2 37-mm.	2 21*	32	1800	600
cr.	Veinticinco de Mayo	"	"	"	"	"	Leghorn	"	"	"	"	"	"	"	"	2 10-in., 8 4-7-in., 4 6-pr., 2 37-mm.	"	"	"	"
d.s.	General Belgrano†	6100	328	59½	24	13,000 R. Y.	Leghorn	1897	1899	696,700	6-3 H.S.	1½	6 H.S.	6 H.S.	6 H.S.	2 10-in., 8 4-7-in., 4 6-pr., 2 37-mm.	—	20	1000	515
d.s.	Pueyrredon †	6100	328	59½	24	13,000 R. Y.	Sestri Ponente	1898	1901	782,000	6-3 H.S.	1½	6 H.S.	5 H.S.	6 H.S.	2 10-in., 8 4-7-in., 4 6-pr., 1 37-mm.	—	20	1000	430

* Moreno and Rivadavia were converted to oil burning and fitted with geared turbines in 1928.

† Converted to oil burning and armament altered in 1929. Used as training ships.

COAST DEFENCE SHIPS.—Libertad and Independencia, 2,510 tons, 13 knots, completed at Birkenhead in 1891-93, and converted to oil fuel in 1927, carry 2 9.4-in., 4 4.7-in., 4 3-pr. guns, 2 1.5-in. A.A.

RIVER GUNBOATS.—Parana and Rosario (Elswick, 1908), 1,055 tons, 2 6-in. howitzers, 6 3-in., 2 L., 15 knots.

TRAINING SHIP (cruiser).—Presidente Sarmiento (Birkenhead, 1896), 2,230 tons, 15 knots, 3 4.7-in., 1 4-in., 2 3-pr., 3 torpedo tubes.

SURVEYING VESSELS.—Madryn, ex-Comodoro Rivadavia, Bahia Blanca, ex-San Luis (Hawthorn Leslie, Newcastle, 1928), 970 tons, 1 3-in., 12 knots, Alfrez Mackinlay (1914), 783 tons, 10 knots.

Sloops.—Murature, King, 1,000 tons, 4,000 B.H.P., 16 knots, 4 1-in. guns; 2 similar buildings.

Tugs.—Mataco, Toba (completed 1928, at Messrs. Hawthorn Leslie's, Newcastle), Azopardo (1919), Ona, Querandi (Thornycroft, 1914), 615 tons, 11 knots, and 17 other ex-U.S.A. A.T.A. tugs.

MINESWEEPERS.—Comodoro Py, Bouchard, Drummond, Granville, Parker, Robinson, Seaver, Fournier, and Spiro (1937-38); 450 tons, 2,000 H.P., 16 knots, 2 3.9-in., 2 2.9-in. guns; Bathurst, Golondrina, Pinedo, Segui, Thorne (ex-German, 1917), 500 tons, 17 knots, 3 3-in. guns.

ORILLAS.—Punta Alta (1937), 800 tons D.W.; Ministro Escarra (1914), 10½ knots; Ministro Frere (1927), and Floritino Ameghino; General Mosconi (building); Punta Ciguera, Punta Rasa, 2,220 tons.

TRANSPORTS.—Chaco, Pampa (1923), 2,100 tons, 11 knots; Patagonia (1925), 9½ knots; P. de Mayo; Ushuaia, 1,250 tons, 12 knots; V. Fidel Lopez, 725 tons, 9 knots; San Julian (ex-U.S. F.S.381), 400 tons.

Argentine Republic.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
<i>Cervantes Class :</i>													
Cervantes (ex-Spanish)	Cartagena	1925	318	31½	10½	2	1522	42,000	36	5 4-7-in., 1 3-in. A.A., 4 M.	2 triple 21-in.	160	540
Churrua													
Juan de Garay (ex-Spanish)	Alcala												
Gallano)													
<i>Mendoza Class :</i>													
Mendoza	J. S. White	1928	325	31-8	12½	2	1570	45,000	36	5 4-7-in., 1 3-in. A.A., 2 2-pr., 4 M.	2 triple 21-in.	160	700
La Rioja	"	1929	"	"	"	"	"	"	"	(La Rioja 39-4 t.)			
Tucuman	"	1928	"	"	"	"	"	"	"				
Catamarca	Schichau	1911	288-7	27½	10	2	972	28,000	32	3 4-in., 2 1-pr.	4 21-in.	100	220
Jujuy	Germany												
Cordoba	Schichau	1910	295½	29-5	10	"	1000	28,000	34-7½			100	200
La Plata	Germany	1911											
<i>Buenos Aires Class :</i>													
San Juan	J. Brown	1937	323	33	8½	2	1350	34,000	35½	4 4-7-in., 8 smaller	8 21-in. (Q)	170	450
San Luis	"	"	"	"	"	"	"	"	"				
Misiones	Cammell	"	"	"	"	"	"	"	"				
Santa Cruz	Laird	"	"	"	"	"	"	"	"				
Buenos Aires	Vickers,	"	"	"	"	"	"	"	"				
Entre Rios	Barrow	"	"	"	"	"	"	"	"				
SUBMARINES—													
Santa Fe	Taranto	1931	226½	21½	13	2	850	3000	17-5	1 4-in., 1 2-pr. A.A.	8 21-in.	41	—
Salta	"	1932	"	"	"	"	1080	1300	9				
Santiago del Estero	"	1933	"	"	"	"							
FRIGATES—													
(Ex-U.S.N. P.F.'s)													
Heroína	U.S.A.	1943	304	37½	13½	2	1430	5,500	20				290
Trinidad	"	"	"	"	"	"	"	"	"				
Sarandi	"	"	"	"	"	"	"	"	"				
Hercules	Canada	1942	301½	36½	13½	2	1430	5,500	20				290

In January 1947 Argentina authorised the acquisition of an aircraft carrier, a cruiser, four destroyers, three submarines, ten patrol vessels and a transport.

BRAZIL.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Oil	Com- ple- ment
											Belt	Deck	Side above Bulk- heads	Gun position		Guns	Torpedo tubes				
														Heavy Guns	Secondary						
b.	Minas Gerais *	19,200 tons	541 ft.	83 ft.	25 ft.	25,000 R. T.	Elswick	1908/1910	1,821,400 £	in. 9-6-4	in. 2	in. 9-6-4	in. 12-8	in. 9	12 12-in., 12 4-7-in., 4 3-in. A.A.; 2 3-pr., 4 1-5-in. M., 8 A.A. M.G.	—	knots 21	tons —	1000		
b.	São Paulo *	"	"	"	"	"	Barrow	1908/1910	"	"	"	"	"	"	10 4-7-in., 4 3-in., 4 3-pr.	4	"	600	"		
Lcr.	Rio Grande do Sul†	3150	401½	39	13½	22,000 B.C.T. (G.) T.	Elswick	1908/1910	"	"	1½	"	"	"	"	21" (D)	27	600	450		

* Reconstructed and converted to oil fuel, 1884-39, 1837-40 respectively.

† Reconstructed, including conversion to oil fuel, at Rio de Janeiro, 1926.

MINELAYERS.—Cananeia, Cabedelo, Camocim, Caravelas, Carioca, 188½ feet, 552 tons, 2,500 H.P., 14 knots, 1 4-1-in. gun, 50 mines; Itacurussa (1901), 210 tons, 10 knots, 1 1-5-in. MINESWEEPERS.—Iguape, Itajaí (1908), 150 tons, 10 knots, 1-85-in.; Itaparica (1894), 221 tons. RIVER MONITORS.—Pernambuco, 470 tons, 11 knots, built at Rio de Janeiro (1910), 2 4-7-in., 2 3-pr. guns; Parnaíba, 600 tons, 180½ feet in length, 12 knots, 1 6-in. gun, 2 3-4-in. Paraguassu, 430 tons, 146 feet, 1 4-7-in. gun, 13 knots; Oiapoque (1907), 185 tons, 14 knots, 2 3-pr., 2 M. SUBMARINE TENDERS.—Ceará (Spezia, 1916), 4,000 tons, 4,100 H.P., 14 knots, 2 4-in., 4 3-pr. REPAIR SHIP.—Belmonte (ex-German SS, Valesia), 5,227 tons gross, 4 4-7-in., 6 6-pr., 2,700 H.P., 12 knots. TRAINING SHIP.—Almirante Saldanha, Vickers, (1834). A four-masted schooner, 3,325 tons, 305 feet over all, 4 4-in. and 1 3-in. A.A. guns, 1 21-in. torpedo tube, 1,400 B.H.P. aux., 12 knots. SURVEY VESSELS.—Rio Branco, 885 tons, 15 knots, 2 6-pr.; José Bonifácio, 1,300 tons, 9 knots, 2 4-in., 2 6-pr. Jacquay, 800 tons, 16 knots. SUBMARINE CHASERS.—Guaíba, Guaporé, Gurupi, Gurupá, Guajara, Goiana, Grajau, Grauna (ex-U.S.) (1942-43), 385 tons, 25 knots; Javari, Jutai, Juruá, Juruena, Jaguarao, Jaguaribe, Jacui, Jundiá (ex-U.S.N.) (1942), 100 tons, 15 knots, 1 3-in.; Rio Negro (1943), 137 tons, 14 knots; Pirajui, Pirambu, Piranha (1947), 132 tons, 1 40-mm., 3 20-mm., 20 knots. TANKERS.—Navais de Abreu (1918), 10 knots, 500 tons; Marajo (ex-Malistan, 1924), 5,563 tons gross, 10 knots; Potengi (1898), 600 tons, 10 knots. OCEAN-GOING TUGS.—Laurindo Pires (1910), 514 tons, 850 H.P., 11 knots; Annibal Mendonça (1919), 1,200 H.P., 12 knots, 2 3-pr.; Heliôr Perdigão, Muniz Freire, Lomba (1924), 200 tons, 850 H.P., 11 knots, 2 3-pr. LIGHTSHIP TENDERS.—Lahneyer, Mario Alves, 280 tons. CORVETTES.—Barreto Menezes, Filipe Camarao, Fernandes Vieira, Henrique Dias, Matias de Albuquerque, Vidal de Negreiros (1941), 12½ knots.

Brazil.

Name or number	Where built	Launched.	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Coal Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—													
Amazonas	Rio de Janeiro	1943	323	33		2	1380	43,000 (G.)	36.5	4 5-in., 6 m. A.A.	12 21-in. (Q.)	190	Tons 500
Araguaia	"	"	"	"	"	"	"	"	"	"	"	"	"
Acre	"	1945	"	"	"	"	"	"	"	"	"	"	"
Ajuricaba	"	1946	"	"	"	"	"	"	"	"	"	"	"
Apa	"	1945	"	"	"	"	"	"	"	"	"	"	"
Araguari	"	1946	"	"	"	"	"	"	"	"	"	"	"
Greenhalgh	"	1941	360	34½	9½	2	1500	50,000	36	5 5-in.	12 21-in. (Q.)	"	"
Marcello Dias	"	1940	"	"	"	"	"	"	"	"	"	"	"
Maris E. Borros	"	"	"	"	"	"	"	"	"	"	"	"	"
Marauhao (ex-Porpoise)	Thornycroft	1913	265.3	26.5	10	2	934	22,500	31	3 4-in., 1 2-pr.	4 21-in. (D.)	100	— 250
DESTROYER ESCORTS—													
Babitonga	Dravo, Will.	1943	306	36½	10½	2	1275	12,000 (G.)	23	3 3-in., 2 40- mm., 8 20- mm.	3 21-in.	218	
Baependi	Federal	"	"	"	"	"	"	"	"	"	"	"	"
Bauru	"	"	"	"	"	"	"	"	"	"	"	"	"
Bracul	"	"	"	"	"	"	"	"	"	"	"	"	"
Bertioga	"	"	"	"	"	"	"	"	"	"	"	"	"
Benevente	Dravo, Will.	"	"	"	"	"	"	"	"	"	"	"	"
Bocaina	Norfolk, N.Y.	"	"	"	"	"	"	"	"	"	"	"	"
Beberibe	Federal	"	"	"	"	"	"	"	"	"	"	"	"
SUBMARINES—													
Humaita	Spezia	1927	282	25.6	14	2	1450 1884	4800 2200	18.5 10	1 4.7-in. A.A. ; 4 m., 20 mines	6 21-in.	55	— 140
	(Ansaldo Fiat)												
Tamoia	Spezia	1936	195½	21	14½	2	620 855	1350 800	14 8	1 3.9-in., 2 m. A.A.	6 21-in.	33	..
Tymbira	(Orlando)	"	"	"	"	"	"	"	"	"	"	"	"
Tupi	"	1937	"	"	"	"	"	"	"	"	"	"	"

CHILE.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery	Where built	Date of launch	Date of completion	Cost	Armour					Armament		Speed	Fuel	Com- ple- ment	
											Belt	Deck	Side above Belt	Bulk- head	Gun position	Guns	Torpedo tubes				
											in. 9-4	in. 4-2½	in. 4½	in. 10	in. 6				10 14-in., 14 6-in., 44-in. A.A., 4 7-8- in., 1 catapult.	4 (sub.) 21	knots 23	tons — 4300	Oil
b.	Almirante Latorre* (ex-H.M.S. Canada)	tons 28,950	ft. 661	ft. in. 92 6	ft. in. 29 0	37,000 P.T. Y.	Elswick	1913 1915		£											1000
cr.	Chacabuco	3417	360	46 6	17 0	15,500	Elswick	1898 1891									6 6-in., several small- er.	2 18"	17		400

* Fitted with bulges, converted to oil burning, and modernised in England (completed 1931).

FRIGATES.—(River Class, ex-R.C.N.) Iquique, Esmeralda, Covadonga (1934-44), 1,445 tons, 20 knots, 4-in. guns.

CORVETTES.—(Flower Class, ex-R.C.N.) Casma, Chipana, Papuda (1944), 1,000 tons, 16 knots.

LANDING CRAFT.—(Ex-U.S.N.) 14 in number.

ONLEX (Armstrongs, 1930).—Maipo, Rancagua, 3,080 tons displacement, 2 4-7-in. guns.

SPECIAL VESSEL.—Araucano (Vickers-Armstrongs, Barrow), completed 1930, displacement 5,890 tons, armament 2 4-7-in., 2 3-in. A.A., speed 13 knots, H.P. 2,500, 1 seaplane.

SURVEYING VESSEL.—Vidal Gormaz (ex-Jason), 700 tons, 13 knots.

TRANSPORT.—Angamos, 3,800 tons, 12 knots; Abtao (1912), 691 tons, 10 knots; Magallanes, 9,000 tons; President Errazuriz, President Pinto, 6,740 tons, 17 knots, 1 5-in.

COASTGUARD VESSELS.—Aguila (1941), 1,026 tons, 12 knots; Micalvi (1925), 850 tons, 9½ knots; Ororpello (1919), 530 tons, 14½ knots, 2 3-in. guns; Yelcho (1906), 467 tons, 12 knots; Piloto Sibbald (1916), 1,100 tons, 11½ knots; Porvenir (1906), 450 tons, 8 knots.

TUGS.—Jancqueo, Galvarino, Colocolo, Sobenes, Cabrales (1930), 790 tons, 11 knots; Contramaestre Britto, Pelantaro (1937), 320 tons, 12 knots; Atlas (1907), 348 gross tons; Anand (1906), 104 gross tons.

Chile.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Coal Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
Serrano	Thornycroft's	1928	300	29	9	2	1090	28,000	30	3 4·7-in., 1 3-in. 3 20-mm.	6 21-in. (r)	130	— 340
Orella	"	"											
Riquelme	"	"											
Hyatt	"	"											
Videla	"	"											
Aldea	"	"											
SUBMARINES—													
Capitan Thompson	Vickers Arm-	1929	275	27·5	14·8	2	1520	3000	15	1 4-in.	8	54	—
Almirante Simpson	strong's	"					1990	1300	9		21-in.		200
Capitan O'Brien	(Barrow)	1928											
H 1. Gualcolda	Fore River,	1915	150·3	15·75	12·3	2	355	480	13		4	22	—
H 4. Guale	U.S.A.						470	640	11		18-in.		17·5
H 5. Quidora													
H 6. Fresia													

DENMARK.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel
			Length (extreme)	Beam	Draught								Coal Oil
FRIGATES													
Niels Ebbesen (<i>ex</i> -H.M.S. Annan)	Hall Russell	1944	Feet 303	Feet 36.5	Feet 12	2	Tons 1370	5,500 (R.)	Knots 20	2 4-in. HA/LA, several smaller.	—		Tons
Holger Danske (<i>ex</i> -H.M.S. Monnow)	Chas. Hill	"	"	"	"	"	"	"	"	"	"		
CORVETTE													
Thetis (<i>ex</i> -H.M.S. Gera- nium)	Wm. Simons	1940	205	33	13.5	1	1000	2,750 (R.)	16½	1 4-in., several smaller.	—		
TORPEDO BOATS													
Willemoes	Copenhagen	1942	279	27.4	8.0	2	710	21,000	35	2 4-in.	6	—	—
Huitfeldt	"	1946	210	27.4	8.0	2	329	6,900	35	4 1.5-in.	21 in.		
Kreiger	"	"	21	14.0	"	2	"	"	29	2 3.4-in., 40- mm.	6		
Krabbe	Copenhagen	1946	210	21	14	2	329	6,900	29	2 3.4-in., 40- mm.	18-in.		
Bille	"	1947	"	"	"	"	"	"	"	"	6	—	—
Buhl	"	1948	"	"	"	"	"	"	"	"	18-in.		
Hammer	"	"	"	"	"	"	"	"	"	"	"		
Holm	"	"	"	"	"	"	"	"	"	"	"		
T5. Hogen	Royal	1933	198.9	19.5	7½	2	285	6,000	27½	2 3.4-in., 2.78	6	51	40
T6. Ornen	Dockyard,	1930	"	"	"	"	"	"	"	M., 2 M.	17.7-in.	"	26
T2. Hvalen	Copenhagen	"	"	"	"	"	"	"	"	"	"	"	"
R4. Havkatten *	"	1919	126.3	13.9	9'	2	110	2,000	24.6 t.	2.6-pr. A.A.	2	24	15
S6. Narhvalen	"	1917	"	"	"	"	"	"	"	"	17.7-in.		—
SUBMARINES—													
Havhesten. H4.	"	1939	155.6	15.3	9.4	2	320	600	15	2 1.5-in.	5		20
Havkalen. H3	"	1937	"	"	"	"	420	220	8	"	18-in.	"	"
Havfruen. H2	"	"	"	"	"	"	"	"	"	"	"	"	"
Havmanden. H1	"	1936	"	"	"	"	"	"	"	"	"	"	"
U2 (<i>ex</i> -H.M.S. Vulpine)	Vickers (Walker)	1943	190	16	13	2	540	615	11½	1 3-in., 3 smal- ler.	4 or 6	27	"
U1 (<i>ex</i> -H.M.S. P.52)	Vickers	1942	"	"	"	"	730	825	10	"	21-in.	"	"
U3 (<i>ex</i> -H.M.S. P.87)	" (Barrow)	1944	"	"	"	"	"	"	"	"	"	"	"

* Used as patrol vessel.

MINELAYERS.—Lindormen (1941), 650 tons, 14 knots, 2 3-in., Laaland, Lougen, 250 tons, 11 knots.**MINESWEEPERS.**—Sohesten, Soridderen, Sohunden (1942), Soulven, 270 tons, 18 knots, 2 3-in. guns, 18 smaller (74–50 tons).**SURVEYING VESSELS.**—Hejmdal, 705 tons, 12½ knots, 2 8-in. guns, 4 7.1-in. A.A.; Ternen, 80 tons, 1 1.46-in.; Freja (1940),

315 tons, 10 knots.

FISHERY PROTECTION VESSELS.—Maagen, 110 tons, 8 knots, 1 1½-in. gun; Alken, one other (*ex*-U.S.S. Restorer).**DEPOT SHIPS.**—Hekla, Fven; Beskytteren (415 tons); Tyr (527 tons).**TRANSPORT SHIPS.**—Sleipner, 110 tons, 8.7 knots; Middegrundten, Fremad. 4 Icebreakers. 3 Cable Ships. 5 tenders.**ROYAL YACHT.**—Danebrog (1932), 1, 130 tons, 14 knots.**MOTOR TORPEDO BOATS.**—10 *ex*-German 92 tons 11 4-in. 3 20-mm., 2 21-in. T.T., 39 knots on 6,000 H.P.**MOTOR MINESWEEPERS.**—9 *ex*-R.N. M.M.S.'s and 21 *ex*-German.

FRANCE.—BATTLESHIPS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery	Where built	Date of launch	Date of completion	Cost	Armour					Armament		Speed	Fuel		Com-plement	
											Belt	Deck	Side	Bulk-head	Gun position	Heavy guns	Secondary		Guns	Torpedo tubes		Oil	Coal
b.	Richelieu	tons 35,000	ft. in. 794 0 108 6 26 7	ft. in. 66 7	ft. in. 26 7	155,000 (G.) L	Brest	1939	1940	£	in. 9-16	in. 9	in.	in.	in. 17			in. 5, 2			8 15-in., 9 6-in. A.A., 12 3.9-in. guns A.A., 67 40-mm. Bofors A.A., 39 Oerlikons 20-mm. A.A.			Nil	knots about 31	tons 6000	1939
b.	Jean Bart	"	"	"	"	"	St. Nazaire A. C. Loire and Penhoet	1939			"	"	"	"	"	●			"	"	"	"
b.	Lorraine	22,189	544 6 88 6 32 0	6 88 6 32 0	42,000 B. P.T.		St. Nazaire—Penhoet	1913	1916	2,642,439	11-7 K.S.	22-1½ K.S.	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	8 13.4-in., 14.5-4-in., 8 3.9-in. A.A., 14 40-mm. A.A. (Bofors), 25 Oerlikons 20-mm. A.A.	Nil	21½	300 2600	1167	

Richelieu very completely refitted in U.S.A. (1943-44).

Jean Bart towed uncompleted to Casablanca in June 1940 and remained there until January 1946. Will be completed on similar lines as Richelieu but with an increased armament.

Lorraine reconstructed and modernised between 1934 and 1937. Employed as a gunnery school ship.

FRANCE.—AIRCRAFT CARRIERS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power	Where built	Date of launch	Date of completion	Armour		Armament		Speed	Fuel Oil	Complement
										Belt Deck	Gun position	Guns	Torpedo tubes			
L.A.C.	Arromanches (ex-H.M.S. Colossus)	tons 14,000	ft. in. 685 0	ft. in. 80 0	ft. in. 23 0	40,000 P.T.(G.)	Vickers (Walker)	1943	1944	in.	in.	6 m.p.s.; a number of light A.A. guns		knots 25	tons	
Aircraft Transport	Béarn *	22,146	599 0	115 6	30 6	37,200 Tur. & R.	La Seyne	1930	1938	3½ 1-3		4 5-in.; A.A. 24/28 A.A.; 26 Oerlikons 20 A.A.		21.5	2070	850
Aircraft Transport	Commandant Teste ||	10,000	548 0	88 7	22 9	21,000 †	Bordeaux	1929	1932	2 1½		12 3.9-in. H.A./L.A. many lighter A.A.		20.5		648
E.C.	Dismude (ex-H.M.S. Biter)	14,000	492 0	69 6	28 6	8,500 Diesel	Brooklyn U.S.A.	1940	1942			— 4-in., 20 A.A.		16		

* Originally designed and laid down as a battleship; reconitioned 1935 and 1944/45.

|| Scuttled at Toulon, 27 November, 1942, but refloated; may be converted into an escort carrier or scrapped.

† Schneider-Zoelly turbines (G.). Yarrow-Loire S.T. boilers.

FRANCE.—CRUISERS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power, Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel Oil	Complement
											Belt	Gun position	Guns	Torpedo tubes			
<i>Training cruiser</i>	Jeanne d'Arc	tons 6496	ft. in. 557 9	ft. in. 57 5	ft. in. 18 8	32,500	St. Nazaire Penhoet	1930	1931	£	in.	in.	8 6·7-in., 4 3-in. A.A., 14/40 A.A., 20/20 A.A.		knots 26	tons 1400	648
<i>Improved La Galissonnière</i>	De Grasse	8000	580 0	61 0	18 2	110,000	Lorient	1946					9 6-in., 12 3·9-in. A.A., 28/40 A.A., 12/20 A.A.	6 21"	33·5	2050	
<i>La Galissonnière</i>	Gloire	7600	589 0	57 4	17 5	84,000 (G.)	Bordeaux	1935	1937		4½	Deck 1½	9 5·9-in., 8 3·5-in. A.A., 24/40 A.A., 16/20 A.A.	4 21·7" (D.)	31	1500	750
	Montcalm	"	"	"	"	"	La Seyne	1935	1937		"	"	"	"			
	Georges Leygues	"	"	"	"	"	St. Nazaire Penhoet	1936	1937		"	"	"	"			
<i>Suffren Class</i>	Suffren	10,000	643 0	65 0	24 0	90,000 Rat. (G.) G.	La Seyne	1927	1930	1,210,000			8 8-in., 8 3-in. A.A., 8 7·46-in. A.A., 18/20 A.A., 12/13 A.A.		32	2000	773
<i>Duquesne Class</i>	Tourville	10,000	626 8	62 4	23 0	120,000 Rat. (G.) G.	Lorient	1926	1928				8 8-in., 8 3-in. A.A., 8 7·40 A.A., 15/20 A.A.		33·5	2050	620
	Duquesne	"	"	"	"	"	Brest	1925	1928				"				
<i>Duguay-Trouin Class</i>	Duguay-Trouin	7249	594 10	57 6	20 8	110,000 P.T. (G.) G.	Brest	1923	1928	..	..	..	8 6·7-in., 4 3-in. A.A., 6/40 A.A., 20/20 A.A.		34	1480	662
<i>M.Cr.</i>	Émile Bertin	5886	580 9	52 0	16 4	102,000 P.T. (G.) Pen.	St. Nazaire	1933	1934	..	..	Deck 2	9 5·9-in., 8 3·5-in. A.A., 16/40 A.A., 20/20 A.A.		34·0	1850	700

*Light Cruisers	Le Fantasque Le Malin Le Terrible Le Triomphant	2569	434	6	39	6	14	0	74,000 T.(G.) (over 74,000 on trials)	Lorient La Seyne Caen Dunkirk A.C. France	1934 1933 1933 1934 1935	1935	1935	5 5.4-in., 8/40 A.A., 10/20 A.A.	6 21.7	37	730	297
	Albatros	2441	423	0	40	0	14	0	64,000 T.G.	St. Nazaire	1930	1931		5 5.4-in.; 4 7.46-in. A.A.	6 21.7"	36	650	220
	Tigre	2126	416	0	37	6	17	6	55,000 T.(G.)	A.C. Loire Nantes A.C.	1924	1928		4 5.7-in., 1/40 A.A.; 8/20 A.A.	3 21.7"	35.5	540	255
Regolo Class	3 ex-Italian cruisers not yet handed over	3600	466	0	47	3	16	10	120,000	Bretagne Italy	1940	1942		8 5.3-in.; 8 40-mm.	8 21"	38	329	329

* Now rated "light cruisers" under French classification. All reached between 43 and 45-25 on trials and still good for a continuous 37 knots under loaded trim.

LIGHT ESCORT VESSELS.—30 ex-American P.C. (6 Sabre, 9 L'Attefif, 15 Carabinier) 1942-43: 300 tons, 20 knots, 1 3-in., 1/40 A.A., numerous depth charges.
 SUBMARINE CHASERS.—69 ex-American S.C. (CH5, 6, 51, 52, 61, 62, 71, 72, 81/85, 91/96, 101/107, 111/115, 121/126, 131/136, 141/146), 1942-43, 110 tons, 15 knots, 1/40 A.A., numerous depth charges; CH2, 3 (1933-34), 148 tons, 20 knots, 1 3-in., 1/40 A.A., Ch10/15 (1939), 102 tons, 16 knots, 1 3-in., N. 20 A.A.; Ch41/43 (1939), 126 tons, 16 knots, 1 3-in., N. 20 A.A. V101/104 (Fairmile, Canada), 1942, 82 tons, 19 knots, 1/47, 1/20 A.A. 28 ex-H.D.M.L. (England), 1941-42, 52 tons, 12 knots.
 MOTOR TORPEDO BOATS.—M.T.B.90, 91, 92, 94, 96, 229, 239 (1942-43), 45 tons, 40 knots, 1/20 A.A., 4 m.g.; 2 torp. M.G.B.120/121 (1945), 65 tons, 40 knots, 12/15 A.A., 8 others bldg. 2 of which as M.T.B., M.G.B.130/131 (1945), 29 tons, 40 knots, 7/15 A.A.
 MINESWEEPERS.—30 ex-American Y.M.S. (1942-43), 280 tons, 12 knots, 1 3-in. gun; Admiral Mouchez (1936), 970 tons, 12 knots; Reine des Flots (1923), 849 tons.
 PATROL VESSELS (ex-Trawlers).—Le Sétoise, l'Ajaccienne, La Toulonnaise (1934-35), 738 tons, 10 knots, 1 3-in. gun; Admiral Mouchez (1936), 970 tons, 12 knots; Reine des Flots (1923), 849 tons.
 SURVEYING VESSELS.—Sentinelle, Laperouse, Beautemps-Beaupre (1947), 1,350 tons; ex-German Astrolabe, Tourteau, Crabe, Boussole (125-300 tons).
 OILERS.—La Drome (1920), 1,055 tons, 1,100 H.P., 10 knots; Le Mekong (1928), Elorn (1930), Var (1931), 5,482 tons, 6,000 H.P., 13 knots; La Charente, La Mayenne (1942-46), 4,289 tons, 5,200 H.P., 15 knots; La Seine, La Saone (bldg.), 19,900 tons, 14,750 H.P., 19 knots; GASOLINE TANKERS.—2 ex-American AOG, L.A.C. Noir, L.A.C. Pavin, 3 ex-American YOG, L.A.C. Chambon, L.A.C. Tchad, L.A.C. Tonléap.
 TRANSPORTS.—Quercy (1938), 4,750 tons, 4,000 H.P., 13 knots; Barfleur (1938), 4,320 tons, 4,000 H.P., 15 knots; Cap des Palmes (1936), 4,160 tons, 4,500 H.P., 17 knots. All of them ex-fruit carriers, diesel driven with exceptional endurance, were armed as auxiliary cruisers during the war. Hamelin (1920), 622 tons, 1 3-in. gun; and 5 ex-enemy ships.
 TRAINING SHIPS.—La Belle Poule, L'Étoile (1932), 227 tons, 120 H.P. auxiliary diesel, 6 knots; Paris (ex-battleship), 22,000 tons; Mutin; Ler Maître le Goff; Giraudia II.
 TARGET SHIP.—L'Impassible (1939), 2,410 tons, 12,000 H.P.
 FLEET TUGS.—Over 40, 600/1,200 tons, 10/13 knots.
 NET LAYERS.—3 ex-American A.N., L'Araignée (ex-Hackberry), Scorpion (ex-Yew), Tarantule (ex-Pepperhead), 700 tons; Retiare (1926), 1,400 tons.
 SUBMARINE PARENT SHIP.—Jules Verne (1931), 5,147 tons, 7,000 H.P., 16 knots; Pollux (1916), an ex-Russian ice-breaker, 2,461 tons, 14 knots (used for Radar training).
 DEPOT SHIPS.—Alphée, Yanniok Joseph.
 FISHERY PROTECTION VESSELS.—Quentin-Roosevelt (1918), 586 tons, 14 knots, 1 3-in. gun.
 CABLE SHIPS.—Alsace, Emile Baudot.

FRANCE.—FLOTILLAS.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
FLOTILLA LEADERS—			Feet	Feet	Feet		Tons		Knots				Tons
*Hoche (<i>ex-Z.25</i>)	Deschimag Bremen	1942	404	38½	17	2	2400	70,000	37	4 5·9-in., 8/37 A.A., 12/20 A.A.	8 21-in.		820
*Marceau (<i>ex-Z.31</i>)	"	1942	404	38½	17	2	2400	70,000	37	2 5·9-in., 1 4-in. A.A., 14/33 A.A., 8/20 A.A.	8 21-in.		820
— (<i>ex-U.S. DD939</i> <i>ex-German Z.39</i>)	"	1942	404	38½	17	2	2400	70,000	37				
*Desaix (<i>ex-Z.5</i>)	"	1935	381	38	16	2	1625	70,000	37		8		700
*Kléber (<i>ex-Z.6</i>)	"	1935	381	38	16	2	1625	70,000	37	5·5 in., 8/37 A.A., 8/20 A.A.	8 21 in.		700
DESTROYERS—													
Forbin	Havre	1928	351·7	32·2	10·2	2	1378	31,000 T(G)	30	3 5·1-in., 1/40 A.A., 8/20 A.A.	7 21·7-in. (T.)	165	370
Basque	Maritime	1929											
L'Alcyon	Bordeaux	1926											
Le Fortuné	Caen	1926											
Ouragan	Caen	1924	347	33·0	13·9	2	1319	33,000 T(G)	30	3 5·1-in., 1/40 A.A., 8/20 A.A.	7 21·7-in. (T.)	165	370
Simoun	St. Nazaire	1924											
Tempête	Nantes—Caen	1925											
Trombe	Bordeaux	1925											
Mistral	Le Havre	1925											
*Alsacien (<i>ex-T23</i>)	Deschimag	1942	319	31	10	2	1200	31,000	31	4 4-in. A.A., 4/ 37 A.A., 12/ 20 M.	2 21·7-in. (T.)		290
*Lorrain (<i>ex-T28</i>)	"	1942								6 5·1-in., 6/40 A.A., 6/20 A.A.	2 21·7-in. (T)		480
L'Aventurier	Bordeaux	1947	363½	36½	10½	2	1772	56,000	37				
4 <i>ex-Italian</i> , not yet handed over													
TORPEDO BOATS—													
*Bir Hakeim (<i>ex-T6</i>)	Schichau	1939	286	28½	7	2	840	22,000	33	1 4·1-in. A.A., 3/37 A.A., 12/20 A.A.	1 21-in. (T.)		200
Dompair (<i>ex-T14</i>)	"	1939	278	29	7	2	250	22,000	33				
*Baccarat (<i>ex-T11</i>)	"	1939	278	29	7	2	850	22,000	33				
La Melpomene	Nantes	1935	264½	25½	9·2	2	610	22,000	34·5	2 3·9-in., N/ 20 A.A.	1 21·7-in. (D.)	131	90
La Flore	Le Trait	1935											
La Cordelière	Le Havre	1936											
L'Incomprise	Le Trait	1936											
Bouclier	"	1937											
FRIGATES AND D.E.													
Sénégalais	U.S.A.	1943	305	31	12	2	1300	6,000 Dies. elect.	20	3 3-in. A.A., 2/ 40 A.A., 12/ 20 A.A., 8 mortars, 2 rails for a/s d.ch.		150	340
Algerien	"	1943											
Tunisien	"	1943											
Marocain	"	1944											
Hova	"	1944											
Somali	"	1944											
Le Brix (<i>ex-P.F. 61</i>)	"	1943	304	37½	12	2	1430	5,500 Rec.	20	Used as mete- orological vessels, etc.			
Laplace (<i>ex-P.F. 93</i>)	"	1944											
Nermoz (<i>ex-P.F. 24</i>)	"	1944											
Lerrier (<i>ex-P.F. 28</i>)	"	1943											
L'Aventure (<i>ex-Braid</i>)	England	1943	301½	36½	12	2	1445	5,500 Rec.	19·5	2 4-in., 12/20 A.A., 4 mor- tars, 2 rails for a/s d.ch.			645
Le Decouverte (<i>ex-Windrush</i>)	Wm. Simons Henry Robb	1943											
L'Escarmouche (<i>ex-Frome</i>)	Blyth Dry Docks	1943											

* *ex-German* leaders transferred in 2.46.

France—continued.

Name or number	Where built	Launched.	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
FRIGATES AND D.E.— <i>contd.</i>													
La Surprise (<i>ex-Torridge</i>)	Blyth Dry Docks	1943	301½	36½	12	2	1445	5,500 Rec.	19·5	2 4-in., 12/20 A.A., 4 mortars, 2 rails for a/s d.ch.			645
Croix de Lorraine (<i>ex-Strule</i>)	Henry Robb	1944											
Tonkinois (<i>ex-Moyola</i>)	Smith's Dock	1944											
COLONIAL SLOOPS—													
Dumont Durville	Bordeaux	1931	341	42	16		1969	3,200 (D.)	15·5	3 5·4-in., 4/40 A.A., 11/20 A.A.		176	270
Savorgnan de Brazza	„	1931											
D'Entrecasteaux	Pt. de Bouc	1931											
La Grandiere	„	1939											
SLOOPS (for Colonial Surveying Service)													
Sans Peur	St. Nazaire	1942	312	45	11		1350 f.l.	2,300 (D.)	18	2 4·1-in.			
Sans Souci	„	1942											
ESCORT VESSELS (fitted as fleet mine-sweepers)—													
Elan	Lorient	1938	256	28	8		630	4,000 (D.)	20	2 3·9-in. A.A., 2/40 A.A., 4/20 A.A., depth ch.		100	100
Cdt. Bory	Dunkirk	1939											
Cdt. Delage	„	1939											
Cdt. Duboc	Nantes	1939											
La Capricieuse	„	1939											
La Moqueuse	„	1940											
Cdt. Domine	„	1939											
La Boudeuse	Dunkirk	1939											
La Gracieuse	Pt. de Bouc	1939											
Cdt. Bisson	Lorient	1946	254	28	10		641	4,000 (D.)	20	1 4·1-in., 4 20-mm.		100	100
Cdt. Ducuing	Nantes	1946											
Cdt. Amyot Dinville	„ Bldg.												
Cdt. de Pimdan	Nantes	1939	256	28	10		647	4,000 (D.)	20	2 3·5-in. or 3·9-in., 1/40 A.A., 6/20 A.A. or 8/20 A.A.			
Chevreuil	Lorient	1939											
Gazelle	„	1939											
Annamite	„	1939											
1ST CLASS SUBMARINES													
Archimède	Caen	1930	302·5	27	16		1379 2060	6,000/ 2,000	17/10	1 3·9-in., 2/20 A.A., 10 T. 21·7-in.		83	290
Le Glorieux	Cherbourg	1931	302·8					6,500/ 2,000	18/10				
Le Centaure	St. Nazaire	1932											
Casabianca	„	1935	302·8					8,000/ 2,000	19/10				
Ouessant	Cherbourg	1936	302·8										
— <i>Ex-U.2518</i>	Blohm & Vos	1944	251½	21½	17	2	1600 1827	4,000 5,000	15/16	4 20-mm.	6 21-in.		
Cdt. Bovan (<i>Ex-U.510</i>)	Deutsche Werft	War	252	22	—	2	1120 1232	4,000 1,000	18/7	1 40-mm. 4 20-mm.	6 21-in.		
Blaision (<i>Ex-U.123</i>)	Deschimag Bremen	„	„	„	—	„	„	„	„	„	„		
2ND CLASS SUB-													
MARINES—													
La Créole	Le Havre	1946	238	22	13½		893 1180	3,000 1,400	17/10	1 3·9-in. A.A., 10 T. 21·7-in.		64	101
L'Artenne	„ Bldg.												
L'Africaine	Le Trait	Bldg.											
L'Astrée	Nantes	Bldg.											
L'Andromède	„ Bldg.												
L'Antigone	Chalons (Schneider)	Bldg.											
Mitte (<i>ex-U.471</i>)	Deutsche Werke	War	218	20	15	2	753 857	2,310 750	18/8	1 40-mm. 4 20-mm.	5 21-in.		
Laubie (<i>ex-U.766</i>)	Wilhelms-haven	„	„	„	„	„	„	„	„	„	„		
Narval (<i>ex-Bronzo</i>)	Taranto	1942	197½	21	16½		714 864	1,600 800	16/8	1 3·9-in., 2/20 A.A., 6 T. 21-in.			

France—continued.

Number and name	Where built	Launched	Dimensions			Number of screws	Displacement Surf./Sub.	Horse- power	Speed Surf. Sub.	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
2ND CLASS SUB- MARINES—			Feet	Feet	Feet		Tons		Knots				Tons
Junon	Havre	1935	224	17½	13	2	597	1300	14	1 3-in., 2 M.	9	43	..
Iris	Dubigeon	1934					800	1230	9		21·7-in.		
La Vestale	Schneider	1932	210	20	13	2	558— 570	1300	14	1 3-in. A.A.	6	43	..
La Sultane	Schneider						787	1000	9		21·7-in.		
Antiope	Havre	1932	216½	20	13	2	565— 571	1300	14	1 3-in. A.A.	15·7-in.	43	..
Amazone	Le Trait	1932					787	1000	9·2		21·7-in.		
Aréthuse	Schneider	1929									15·7-in.		
MINELAYING SUB- MARINE—													
Rubis	Toulon	1930	216·5	23·3	13·5	2	669 910	1300 800— 1000	12 9	1 3-in., 1 M., 32 mines.	5 21·7-in.	40	..

French submarines are divided into two classes. 1st class: All vessels of 900 tons and above in the surface condition.
2nd class: All smaller vessels, including the minelayers.

GREECE.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery	Where built	Date of launch	Date of completion	Cost	Armour					Armament		Speed	Coal Oil	Com- ple- ment
											Belt	Deck above Belt	Side Bulk- head	Heavy Guns	Gun position	Guns	Torpedo tubes			
cr.	Georgios Averof *	tons 9301	ft. 462	ft. 69	ft. 24½	19,000 (21,000) E.	Leghorn (Orlando)	1910|1911	1,100,000 £	8-3½ in.	in. 1½	in. 7	in. 7	in. 8-6½	in. 7	4 9-2-in., 8 7-5-in., 16 3-in., 4 3-pr., 2 3- in. A.A., 2 M.	3 (sub.) 18-in.	knots 22½	tons 1500	620
cr.	Ex-Italian Eugenio di Savio†	8800	610½	57½	16½	120,000	Genoa (Ansaldo)	1935|1936		4-1½ in.	1½			4-3		8 6-in., 6 3-9-in., 8 37-mm., 12 20- mm.	6/21"	36.5	1560	600

* Refitted 1932. Not serviceable, used as Depot Ship.

† Assigned to Greece by Peace Treaty.

TRAINING SHIPS.—Graz (1929), 1,870 tons, 11 knots, 4 3-in. guns. Ionia.
REPAIR SHIP.—Hephestos (1920), 4,549 tons gross, 11½ knots, 4 4-in. A.A.
M.T.B's., T1 and T2, Thornycroft type, 55 ft., 37 knots, 2 Lewis guns, 2 T.T., 4 built at Venice, for Customs Service.
SALVAGE VESSELS.—Tenedos, 450 tons, 13 knots; ex-H.M.S. Salvature (1942), 1,440 tons.
LANDING SHIP TANKS.—Chios, Lemnos, Lesbos, Samos (ex-U.S. L.S.T's 33, 35, 36, 37), Alakmon, Axios, Alpheos, Strymon, Acheloos, Pinios (ex-R.N. L.S.T's.)
MOTOR MINESWEEPERS.—Patmos, Calimnos, Leros, Salamina, Paralos, Karteria, Amphroessa, and 7 others, ex-B.Y.M.S., 280 tons, 13-in.; also ex-R.N. M.M.S's.
M/S TRAWLERS.—12 in number.
MOTOR LAUNCHES.—17 in number (ex-British).
TRANSPORTS.—Patrai, Thessaloniki (ex-R.N.), 1941, 1,060 tons, 16.5 knots.
SUBMARINE CHASER.—King George II (ex-U.S.P.C.), 280 tons, 22 knots, 1 3-in.

Greece.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel	
			Length (extreme)	Beam	Draught								Coal	Oil
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons	
Adrias (<i>ex-British Hunt Class</i>)	Yarrow	1941–42	280	31½	8	2	1000	19,000	27½	4 4-in.	2 21-in.			
Aegean "	Thornycroft	"	"	"	"	"	"	"	"	"	"			
Crete "	Swan Hunter	"	"	"	"	"	"	"	"	"	"			
Hastings "	Vickers	"	"	"	"	"	"	"	"	"	"			
Kanaros "	"	"	"	"	"	"	"	"	"	"	"			
Miaoules "	Swan Hunter	"	"	"	"	"	"	"	"	"	"			
Pindos "	Yarrow	"	"	"	"	"	"	"	"	"	"			
Themistocles "	Stephen	"	"	"	"	"	"	"	"	"	"			
Paul Countouriotis	Odero, Genoa	1931	314·5	32	12	2	1480	45,000	40	4 4·7 in., 4 2-pr. A.A., 40 mines.	3 21-in.	156	—	—
Spetsai "	"	1931	314·5	32	12	2	1480	45,000	40	"	(T.)		630	
*Aetos	Birkenhead	1911	293	27·7	9·6	2	1013	19,750	32	4 4-in., 2 2-pr. (50 mines)	3 21-in.	102	—	—
*Panther "	"	"	"	"	"	"	"	"	"	"	(T.)		260	
*Ierax	"	"	"	"	"	"	"	"	"	"	4 21-in.			
Salamis (<i>ex-H.M.S. Borias</i>)	Palmer's	1930	323	32·3	10·0	2	1360	34,000	36	2 4·7-in.	21-in.		—	—
Navarinon (<i>ex-H.M.S. Echo</i>)	Denny	1934	329	33·3	10·0	2	1370	36,000	36	3 4·7 in., 1 3-in.	4 21-in.		480	
TORPEDO BOATS—														
†Pergamos	Fiume	1914	178·4	18·8	5	2	237	5000	28½	1 11-pr.	3 18-in.	25	21	31
†Proussa	"	1914	178·4	18·8	5	2	237	5000	28½	1 11-pr.				
CORVETTES—														
Apostolis (<i>ex-British Flower Class</i>)	Harland & W.	1940	205	33	13·5	1	1000	2750 (R.)	16	1 4-in., 2 6-pr.				
Kriezis "	A. & J. Inglis	1940	"	"	"	"	"	"	"					
Tombazis "	Fleming & F.	1941	"	"	"	"	"	"	"					
Saktouris "	Harland & W.	1940	"	"	"	"	"	"	"					
SUBMARINES—														
Papanicolis	Ch. de la Loire, Nantes	1926	203½	17·7	12·3	2	Surf. 567 Sub. 760	1300 1000	Surf. 14 Sub. 9·5	1 4-in., 1 2-pr. A.A.	6 21-in.	30		
Nereus	"	1927	226½	18½	12·6	2	689 945	1500 1200	14 9·5	1 4-in., 1 2-pr. A.A.	8 21-in.	42		
Matrozos	<i>ex-Italian</i>	1936	197½	21		2	650 855	1350 800	14 8·5	1 3·9-in.	6 21-in.	44		
Pipinos (<i>ex-British Unity Class</i>)	Vickers (Barrow)	1943	190	16	13	2	540 730	615 825	11·25 10	1 3-in.	4-6 21-in.	27		
Delphin "	"	1944	"	"	"	"	"	"	"	"				
Xifias "	Vickers (Walker)	1943	"	"	"	"	"	"	"	"				
Triaina	"	1944	"	"	"	"	"	"	"	"				
Argonafic	"	1944	"	"	"	"	"	"	"	"				
Amfitriti	"	1942	"	"	"	"	"	"	"	"				

* Reconstructed by Messrs. J. S. White & Co., Cowes, 1924–25.

† Surrendered Austrian torpedo-boats. 3 others built 1907, laid up.

ITALY.—BATTLESHIPS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour					Armament		Speed	Fuel Coal	Com- ple- ment
											Belt	Deck	Side above Belt	Bulk- head	Gun position	Guns	Torpedo tubes			
															Heavy guns					
b.	Andres Doria †	tons 23,622	ft. in. 611 6	ft. in. 92 0	ft. 30	75,000 (G.)	Spezia	1913 1916	1916	£	in. 10-4	in. 1½	in. 6	in. K.S.	in. 9½	10 12 6-in., 12 5 3- in., 10 3 5-in., 39 A.A. M.G., 1 cata- pult, 1 aircraft.		knots 27	tons 2000	1074
b.	Giulio D'Amico †	"	"	"	"	"	Castellam- mare	1913 1915	1915		in. K.S.	"	"	"	"	"		"	"	"

† Reconstructed 1940.

ITALY.—CRUISERS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed knots	Fuel Oil	Complement
											Side Deck	Gun position	Guns	Torpedo tubes			
Abruzzi Class	Luigi di Savoia	tons 7874	ft. in. 613 9	ft. in. 61 0	ft. in. 17	100,000 P.T. (G.)	Odero-Terni, Orlando Spezia	1886	1887	£	in. 6	in.	10 6-in., 8 3.9-in. A.A., 8 7.5-in. A.A., 8 M., 4 aircraft, 2 catapults. Fitted for minelaying.	6 21" (T.)	knots 35	tons 1200	600
	Giuseppe Garibaldi	"	"	"	"	"	Cantieri Riuniti dell' Adriatico, Trieste	"	"		"		A.A., 8 7.5-in. A.A., 8 3.9-in. A.A., 8 7.5-in. A.A., 8 M., 2 aircraft, 1 catapult. Fitted for minelaying.	21" (D.)	"	"	"
Montenuccoli Class	Raimondo Montenuccoli	6828	597 9	54 6	14.9	104,000 P.T.	Ansaldo, Genoa	"	"				8 6-in., 6 3.9-in. A.A., 8 7.5-in. A.A., 8 M., 2 aircraft, 1 catapult. Fitted for minelaying.	4 21" (D.)	37	1200	520
	Luigi Cadorna	5000	559 6	51 1	14	96,000 (G.)	Stabilimento Tecnico Triestino, Trieste	1931	1933		2 2		8 6-in., 6 3.9-in. A.A., 8 7.5-in. A.A., 8 M., 1 catapult, 2 seaplanes.	4 21" (D.)	37 (39½ t)	1000	530
Condottieri Class																	

ITALY.—FLOTILLAS.

Name or number	Where built	Launched	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—													
Granatiere	Palermo	1938	Feet 351	Feet 33½		2	Tons 1620	48,000	Knots 38	5 4·7-in., several smaller	6 21-in. (T.)	240	Tons 500
Carabiniere	Riva Trigoso	"	"	"		"	"	"	"	A.A.	"	"	"
Nicoloso da Recco	Ancona	1929	351	33½		2	1590	52,000	"	6 4·7-in., several smaller	3 21-in. (T.)	"	"
Grecale	Ancona	1934	350	33½	10	2	1449	44,000	38	4 4·7-in., 4 1·5-in. A.A.	6 21-in.	156	600
SUBMARINES*—													
TORPEDO BOATS—													
Monzambano	Orlando	1923	280	26		2	1000	22,000 (G.)	33½	4 4-in.	6 18-in.	105	
Orione	Palermo	1937	293	31		"	860	16,000 (G.)	28	2 3·9-in., 10 M.	4 18-in. (D.)		
Orsa	Palermo	1937	293	31		"	860		28				
Clio	Ansaldo	1938	267	26		"	680	19,000 (G.)	34	3 3·9-in., 6 1·5-in.	4 18-in.		
Calliope	"	"	"	"		"	"	"	"	"	"		
Libra	Fiume	"	"	"		"	"	"	"	"	"		
Aretusa	Ansaldo	"	"	"		"	"	"	"	"	"		
Cassiopea	Riva Trigoso	1936	269	27		"	650	"	"	"	"		
Sagittario	Fiume	"	"	27		"	"	"	"	"	"		
Sirio	"	"	"	"		"	"	"	"	"	"		
Nicola Fabrizi	Odero	1918	240	24		"	635	15,000 (G.)	32½	4 4-in.	"		
Giacinto Corini	"	"	"	"		"	"	"	"	"	"		
Artorio Mosto	Naples	1915	"	"		"	620	"	"	5 4-in.	"		
Guisepe C. Abba	Odero	"	"	"		"	"	"	"	"	"		
Rosalino Pilo	"	"	"	"		"	"	"	"	"	"		
E. Giovannini	Naples	1922	180	19		"	180	2,400 (R.)	25	2 4-in.	2 18-in. (D.)		
CORVETTES—													
Ape	Naples	1942	207	23			570	3,400 (Dies. elect.)	18½	1 3·9-in., several small A.A.	2 18-in.		
Chimera	Trieste	"	"	"		"	"	"	"	"	"		
Cormorano	"	"	"	"		"	"	"	"	"	"		
Danaide	Genoa	"	"	"		"	"	"	"	"	"		
Driade	"	"	"	"		"	"	"	"	"	"		
Fenice	"	"	"	"		"	"	"	"	"	"		
Flora	"	"	"	"		"	"	"	"	"	"		
Folaga	"	"	"	"		"	"	"	"	"	"		
Gabbiano	"	"	"	"		"	"	"	"	"	"		
Gru	"	"	"	"		"	"	"	"	"	"		
Ibis	"	"	"	"		"	"	"	"	"	"		
Minerva	Trieste	"	"	"		"	"	"	"	"	"		
Balconetta	Milan	"	"	"		"	"	"	"	"	"		
Pellicano	Genoa	"	"	"		"	"	"	"	"	"		
Pomona	Trieste	"	"	"		"	"	"	"	"	"		
Scimitarra	Milan	"	"	"		"	"	"	"	"	"		
Singe	Trieste	"	"	"		"	"	"	"	"	"		
Sibilla	"	"	"	"		"	"	"	"	"	"		
Urania	"	"	"	"		"	"	"	"	"	"		

* Eight submarines surrendered to Allies. Remainder to be sunk. U.K. and U.S.A. have returned their share (4).

MINESWEEPERS.—About 18 in number, 150 tons, 14 knots, 1 3-in. gun.

OIL TRANSPORTS.—Nettuno, 9,555 tons, 14 knots, 3 4·7-in., 2 3-in.; Lete, 1,162 tons, 10 knots, 3 3-in.

SURVEYING VESSELS.—Cherso, 3,988 tons, 10½ knots, 4 4·7-in. guns; Azio (1927), 615 tons, 15 knots, 2 4-in., 1 3-in.

TRAINING SHIPS.—Amerigo Vespucci (Castellamare, 1931), 3,543 tons, 1,800 H.P. (Diesel-electric), 11 knots, 4 3-in. A.A.,

2 A.A. M.G.

SUBMARINE DEPOT SHIP.—Pacinotti (1924), 2,730 tons, 19 knots, 4 3-in. A.A.

CABLE SHIP.—Rampino, 670 tons, 10 knots.

WATER CARRIERS.—Po, 11½ knots, 2 4-in., 4 M.G.; Mincio, 645 tons, 9 knots; Sesia, 1,050 tons, 9½ knots, 4 M.G.; Arno (1929), 630 tons, 9 knots; Garda (1934), 592 tons, 9 knots; Frigido (1912), 398 tons, 9 knots; Vipacco (1925), 265 tons, 9 knots, and many others.

LIGHTHOUSE TENDERS.—Scilla, 350 tons, 9 knots, 1 3-in.; Lido, 226 tons, 12 knots, 1 3-in.

MOTOR VEGETTES.—Noe. Vas 201, 204, 211, 218, 222, 224, 233, 235, 60 tons.

SALVAGE SHIPS.—Ciclope (1903), 1,050 tons, 13·5 knots, 1 3-in.; Titano (1913), 828 tons, 14 knots, 1 3-in.

MOTOR MINESWEEPERS.—(Ex-R.N. B.Y.M.S.) Anemone, Azalea, Begonia, Biancospino, Dalia, Fiordaliso, Gardenia, Geranio, Magnolia, Mughetto, Narciso, Oleandro, Orchidea, Primula, Tulipano, Verbena, 290 tons, 15 knots, 1 3-in., 2 20-mm.

NETHERLANDS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power and boilers	Where built	Date of launch	Date of completion	Cost	Armour				Armament		Speed	Fuel Complement	
											Belt	Deck	Side Bulk-head above belt	Gun position	Guns	Torpedo tubes		Coal	Oil
Colo- sus Class	Karel Doorman (ex-Venerable)	tons 14,000	ft. 685	ft. 80	ft. 23	40,000 P.T. (G.)	Cammell Laird	1944	1945	£	in.	in.	in.	in.	6 M.F.F., several others.		knots 25	tons —	
cr.	De Beyer	8350	610	56½	19½		Rotterdam Dry Dock Co.	Bdg.			3-4				8 6-in., 8 57-mm., 8 40-mm.	6 21-in.	25		920
cr.	Zeven Provinciën	"	600	"	"		Rotterdam Wilton- Fijendord	Bdg.											920
l.cr.	Trump	3350	433	40½	15	56,000	Amsterdam	1937	1938		2	1		10 H.N.S. H.S.	6 5.9-in. in Tromp; 10 4-in. in Heemskerck, 4 7.5-in. A.A., 4 5-in., 1 seaplane.	6 21-in. (T.)	32½ "	— 860	330 "
l.cr.	Jacob van Heemskerck	"	"	"	"	"	"	1939	1941 (in U.K.)		"	"					"		"

MINELAYERS.—Douw Aukes (1922), 687 tons, 13 knots, 3 3-in. A.A., 2 M., 130 mines; Willen van der Zaan, 1,350 tons, 15 knots, 2 4.7-in., 4 1.5-in., 4 M., 120 mines.

MINESWEEPERS.—(Bathurst Class, ex-R.A.N.), 1941: Ternate, Boeroe, Batjan, Ceram, Tidore, Morotai, Ambon, Banda, 650 tons, 16 knots, 1 4-in., 2 20-mm.; Abraham van der Hulst, Pieter Florisz, Wilhelm van Ewijk, Jan van Gelder, Abraham Crinssen (1937), 460 tons, 15½ knots, 1 3-in., 4 40-mm.

SURVEYING VESSELS.—Hydrograf (1911), 260 tons, 9 knots; Zeefakkel and Luijmes (1938).

SUBMARINE DEPOT SHIP.—Cornelius Dreebel (1915), 688 tons, 170 H.P. (Diesel), 6 knots, 1 1.5-in.; Medusa, 593 tons; Gruno, 530 tons.

SLOOPS.—Van Kinsbergen (1939), 1,760 tons, 25 knots, 4 4.7-in. guns.

GUNBOATS.—Van Speijk (ex-K 3) (1941), 1,300 tons, 4 4.7-in., 4 40-mm.; Flores (1927), 1,800 tons, 14½ knots, 3 5.9-in., 6 M.

MOTOR TORPEDO BOATS.—ex-British. Number unknown.

MOTOR MINESWEEPERS.—16 in number, M.M.Ss. and 10 in number B.Y.M.Ss.

HOSPITAL SHIPS.—Oranje, Tijlialangka, Ophir, Tasman, Maetsuycker, Melchior Treve

TRAINING SHIPS.—Christian Cornelis, Schorpiden, Buffel, Noord-Brabant, Marnix (ex-H.M.S. Garland), 3 4.7-in., 1 3-in., 4 21-in. r.t., 34 knots.

BOOM DEFENCE VESSELS.—2 ex-British (Barglow and Barnehurst).

REPAIR SHIPS.—VULKAAN (ex-H.M.S. Beachy Head), 8,580 tons, Mercuur, 265 tons.

Netherlands.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel
			Length (extreme)	Beam	Draught								Coal Oil
DESTROYERS—													
Jan van Galen (<i>ex</i> -H.M.S. Noble)	Denny Bros.	1941	356½	35½		2	1760	40,000	36	6 4·7-in., 1 4-in., 1 m.p.p.	5 21-in.		485
Tjerk Hiddes (<i>ex</i> -H.M.S. Nonparell)	"	"	"	"		"	"	"	"	6 4·7-in., 1 m.p.p.	10 21-in.		"
Piet Hien (<i>ex</i> -H.M.S. Serapis)	Scotts	1943	362½	35½		2	1700	40,000	36	4 4·7-in., several small A.A.	8 21-in. (Q.)		
Kortenaer (<i>ex</i> -H.M.S. Scorpion)	Cammell Laird	1942	"	"		2	"	"	"	"	"		
Evertsen (<i>ex</i> -H.M.S. Scourge)	"	"	"	"		"	"	"	"	"	"		
Banckert (<i>ex</i> -H.M.S. Quilliam)	Hawthorn Leslie	1941	"	"		"	"	"	"	"	"		
FRIGATE—													
Johan Maurits Van Nassau (<i>ex</i> -H.M.S. Ribble)	Simons Renfrew	1943	301½	36½	9	2	1450	5,500	20	2 4-in. A.A., 4 20-mm.			
ESCORT DESTROYERS—													
3 in No. 1 in No. 1 in No. 1 in No.	De Schelde Rotterdam Netherlands Wilton Fijenoord	1948	371	37½	12½	2	2097	45,000	32	4 4·7-in., 5 40-mm.	Nil	260	
SUBMARINES—													
Zwaardvisch (<i>ex</i> -H.M.S. Talent)	Vickers (Barrow)	1943	265	27·5	12	2	1090 1575	2500 1450	15½ 9	1 4-in.	6 21-in.	53	
Tijgerhaai (<i>ex</i> -H.M.S. Tarn)	"	1944	"	"	"	"	"	"	"	"	"	"	
O 21	De Schelde	1939	254½	25½	13	2	888 1205	5000 —	20 9	1 3·5-in.	8 21-in.	37	
O 23	Rotterdam	1931	254½	25½	13	2	888 1205	5000 —	20 9	1 3·5-in.	8 21-in.	37	
O 24	"	1924	"	"	"	"	"	"	"	"	"	"	
O 27	Wilton Fijenoord	1940	"	"	"	"	"	"	"	"	"	"	

NORWAY.

Class	NAME	Normal Displacement	Length (extreme)	Beam	Draught	Horse-power	Where built	Date of launch	Date of completion	Cost	Armour				Armament		Speed		Fuel		Com- ple- ment
											Belt	Deck	Side Bulk-head	Gun position	Guns	Torpedo tubes	knots	16-5	Coal	Oil	
c.d.s.	Harald Haarfagre*	tons 3858	ft. 304	ft. 48½	ft. 17½	4500	Elswick	1896/1898		£ 300,000	in. 7	in. 2		Heavy guns	6 4-7-in., several smaller A.A.	3 18-in.			tons 550	—	249

* To be scrapped, used as Depot Ship.

PATROL VESSELS.—Nortkapp (1937), 273 tons, 13-7 knots, 11-85-in.; King Haakon VII (ex-U.S. P.C.467), Seaje (1937), 273 tons.
 MINELAYERS.—Laugen (1918), 335 tons, 9½ knots, 23-in., m., 50 mines.
 MINESWEEPERS.—Rauma, Otra (1940), 360 tons, 13-5 knots, 11-5-in., 2 m.; Bangor Class (ex-R.N.) Glomma, Tana, 650 tons, 14 knots, 13-in.
 MOTOR LAUNCHES.—ex-British, 3 in number.
 TRAWLERS.—A number of British Isles Class.
 WHALERS.—A large number of miscellaneous craft.
 DEPOT SHIPS.—Nortvard (1925), 4,000 tons; Heimdal (1892), 660 tons, 12 knots, 4 12-pdr.; Ranen (1918), 463 tons.
 MOTOR MINESWEEPERS.—2 ex-R.N. H.M.S.'s, Orkla, Vefsn (1944), 360 tons, 7 ex-U.S.N. Y.M.S.'s (1943), 300 tons, 13-in.
 SUBMARINE TENDERS.—Sarpen (1939), 372 tons.
 SUBMARINE CHASERS.—Hitra, Vigra, Hessa, 85 tons, 4,000 S.H.P., 19-5 knots (ex-U.S.N. S.C.'s).

Norway.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel Coal Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—													
Bergen	Scotts	1945	Feet 363½	Feet 35½	Feet 10	2	Tons 1710	40,000	Knots 36	4 4.5-in., 1 40-mm.	4 21-in.		Tons
Stavanger	Yarrow	1945	"	"	"	"	"	"	"				
Trondheim	"	1944	"	"	"	"	"	"	"				
Oslo	Scotts	1945	"	"	"	"	"	"	"				
Stord	J. S. White	1943	362½	35½	10	2	1710	40,000	36	4 4.7-in.	8 21-in. (Q.)		
Hunt Class—													
Narvik	Cammell Laird	1942	280	31½	8	2	1050	19,000	29	4 4-in.	2 21-in.		
Arendal	"	1941	320	33	10	2	1220	30,000	"	6 4-in. 4 4.7-in., 2 40-mm.	2 21-in.		
Alesund	Horten	Still build- ing											
TORPEDO BOATS :													
First Class—													
Sleipner	"	1936	236.3	25.5	6.9	2	625	12,500	30	3 3.9-in., 1 1.5- in. A.A.	2 21-in.	72	— 100
Gyller	"	"	"	"	"	"	"	"	"	"	"	"	"
Odin	"	1939	"	"	"	"	"	"	"	"	"	"	"
Tor	Fredrikstad	"	"	"	"	"	"	"	"	"	"	"	"
Balder	Horten	"	"	"	"	"	"	"	"	"	"	"	"
CORVETTES—													
Nordkyn	Harland Wolff	1942	205	33	15½	1	1060	2,750	16.5	1 4-in., 6 20- mm.	—	89	
Soerøey	"	1941											
Andenes	Ailsa	1941											
MOTOR TORPEDO BOATS—													
Ex-R.N. M.T.B.'s—													
Orn, Falk, Hauk, Ramm, Stegg, Skarv, Lom, Teist, Jo, Tjeld	Fairmile	1943	115	21½	5½		102	4800	30	1 6-pr., 1 2-pr., 6 M.	2 21-in.	20	
EX-GERMAN E BOATS													
B.11, 12, 13 Blinks, Brann, Kjekk, Lyn, Storm, Kvik, Tross, Rapp, Snar	Germany	War	120½	17	5½	2	100	7,500	45		2 21-in.	21	
SUBMARINES—													
Ex-British Unity Class													
Uthang	Vickers (Walker)	1944	196	16.1	12.9	2	540 730	615 825	11½ 10	1 3-in.	4 21-in.	27	
Utvaer	Vickers (Barrow)	1943	"	"	"	"	"	"	"	"	"	"	"
Utstein	"	"	"	"	"	"	"	"	"	"	"	"	"
Utsira	"	"	"	"	"	"	"	"	"	"	"	"	"
Ula	"	"	"	"	"	"	"	"	"	"	"	"	"
Kya	Deutsche	1942	220	20	15	2	757 857	3,200 750	17 7.6	1 40-mm., 4 20-mm.	5 21-in.		
Kynn	Werft												
Kaura	"	1944	113½	10	12		228 252	575 550	9.75 12.5		2 21-in.		
Knerter	"												

SOVIET UNION.—BATTLESHIPS.

Class	NAME	Normal displacement	Length (extreme)	Beam	Draught	Horse-power	Where built	Makers of engines	Date of launch	Date of completion	Cost	Armour					Armament		Speed	Fuel		Com- ple- ment	
												Belt	Deck	Side	Bulk-head	Gun position	Guns	Torpedo tubes		Coal	Oil		
b.	Sovietaki Soyuz (ex-Lenin)	tons 35,000 ?	ft. 800	ft.	ft.		Baltic Ship-building Yard, Lenin-grad	Baltic Ship-building Yard, Lenin-grad	Bdg. Ansaldo	1911	1914	£	in.	in.	in.	in.	in.	16-in., 5-9-in.		knots		tons	
b.	— (ex-Italian Giulio Cesare)	23,622	611½	94	30	75,000	Ansaldo	Ansaldo	1911	1914		1.	3					10 12-6-in., 12 4-7-in., 8 3-9-in., 36 others.		27	2500	1080	
b.	Serastopol (ex-Parizskaya Kommuna) *	23,000	594	87	27½	42,000 P.T.	Baltic Works, Lenin-grad	Baltic Works, Lenin-grad	1911	1915		9.	3			12-10	6	4 (sub.) 18-in.		23	2000	1125	
b.	Oktabrskaya Revolyutsiya (ex-Gangut) †	23,000	594	87	27½		"	"	1911	1915								10 3-in. A.A., 8 in. and smaller; 2 secondary armament between ships.)					
b.	Petrovskiylovsk (ex-Marat) ‡	23,606	594	87	31		"	"	1911	1911		2	1					4 10-in. (twin), 8 4-7-in. (twin), 4 smaller.		15			
cds.	Vihorg (ex-Finish Vänämöinen)	3,900	295	54	14½	4800	Crichton Vulcan Abo.	Crichton Vulcan Abo.	1930	1932													

* Modernised, 1937.

† Modernised, 1933.

‡ Modernised 1931, possibly scrapped due to damage.

SOVIET UNION.—CRUISERS.

Class	NAME	Normal displacement	Length (ex-treme)	Beam	Draught	Horse power	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel		Complement
											Belt	Deck	Guns	Torpedo tubes		Coal	Oil	
a.c.	— (ex-Graf Zeppelin)	tons 25,000	ft. 820½	ft. 88½	ft. 18½	100,000	Deutsche Werke Kiel	1939	Not complete 1942	£	in.	Has side belt	16 5.9-in., 10 4.7-in., 27 37-mm.		knots 30	tons		
cr.	Kalinin	7725	613½	58	18	120,000	Komsomolsk						9 7.7-in., 6 3.9-in., many smaller.	6 27-in.	34			
cr.	Kaganovitch	"	"	"	"	"	Leningrad	Bldg.	1944 ?				"					
cr.	Chibulov ?	"	"	"	"	"	"	"					"					
cr.	Chapayev ?	"	"	"	"	"	"	"					"					
cr.	One other	"	"	"	"	"	Nikolaev	"					"					
cr.	Kulibayev ?	"	"	"	"	"	"	"					"					
cr.	One other	"	"	"	"	"	"	"					"					
cr.	One other	"	"	"	"	"	Komsomolsk	"					"					
cr.	Kirov	7725	613½	58	18	105,000	Leningrad	1936	1937		3		9 7.7-in., 4 4-in., 8 7.5-in. A.A., 2 aircraft.	6 27-in. (T.)	34		624	
cr.	Maxim Gorki	"	"	"	"	"	"	1937	1939		2		"		"			
cr.	Molotov	"	"	"	"	"	"	1938	1940		3		"		"			
cr.	Voroshilov	6000	57½	54	17½	72,000	Kiel	1938	1940		1		9 5.9-in., 8 3.5-in.	12 27-in.	32			
cr.	Admiral Makaroff (ex-Nurnberg)	15,200	682	71	20	130,000	Bremen	1939	1941		4		8 8-in., 12 4.7-in.	12 27-in.	32½			
cr.	— (ex-Lutzow)										3½		"		"			
	— (ex-Italian E. Filiberto Duca D'Aosta)	7789	610½	57½	16½	110,000	Odero-Terni Orlando	1933	1935		1½	4	8 6-in., 6 3.9-in., 8 37-in. A.A., 13 20-in. A.A.	6 27-in.	36.5	1731	551	
m.cr.	Martí	3500	410						1938		1½	3	4 5.7-in., 3 3-in. A.A., 300 mines.		25			
cr.	Krami Kavkas (ex-Ad. Lasarev)	7600	535	51½	19	60,000	Nikolaev	1916	1930		3	1	4 7.7-in., 4 3-in. A.A., 4 4-in. A.A., 4 M., 100 mines, 2 sea-planes.	12 27-in. (T.)	29½	540	680	650

SOVIET UNION.—CRUISERS—continued.

Class	NAME	Normal displacement	Length (extreme)	Beam	Draught	Horse-power	Where built	Date of launch	Date of completion	Armour		Armament		Speed	Fuel	
										Belt	Gun position	Guns	Torpedo tubes		Coal	Oil
cr.	Krasny Krym (ex-Proflintern)	tons 7300	ft. 520	ft. 50½	ft. 18½	55,000 P.T. (Y.)	Reval	1915	1925	in. 3	in. 3	15 5.1-in., 4 4-in. A.A., 4 3-in., 4 in., 2 air- craft, 100 mines.	12 27-in.	knots 28½	tons 640	680

GUNBOATS.—Krasni Vostok, Sun Yat Sen, Lenin, Chicherin (1910), 950 tons, 11 knots, 1 6-in., 1 3-in.; Bednota, Krasnoe-Znamya, Rabochi, Krasni Buryat, Krasni Mongol, Krasni Moryak (1907), 11 knots, 190 tons, 2 4.7-in.; Krasni Azerbaizhan, Lenin, No. 3 (1909), 640 tons, 12 knots, 2 4-in., 2 3-in.; Krasnaya Gruzija (1906), 1,100 tons, 9 knots, 2 5.1-in., fitted for minelaying; Altvater, Bakinsky Rabotchi, Markin (1905), 710 tons, 25 knots, 3 4-in., 2 in.; Krasnaya Zvezdo (1906), 1,300 tons; Krasnoe Znamya (1895), 1,500 tons, 5 5-in., 2 3-in.; Karjala (1918), ex-Finnish, 350 tons, 14 knots, 2 3-in.; Yrjo and Aunus (ex-Finnish); Presidentas Smetone, 380 tons, 2 3-in., 16 knots; Laine, 400 tons, 12 knots, 2 7.5 mm.; Mardus, 80 tons, 2 3-in.; and many others.

MINELAYERS.—25 Oktyabrya (1873), 4,500 tons, 11 knots, 4 3-in., 600 mines; Suurop, Ristna (1905), 450 tons, 12 knots, 1 3-in.; Marti, 12 others.

MINESWEEPERS.—Mikula, Iskra, 500 tons, 1 3-in.; Zapal, Zmei, Kluz (1911), 180 tons, 11 knots, 1 3-in.; Djalita (1926), 359 tons, 10 knots, 2 3-in.; Dorotea (1924), 443 tons, 10 knots, 2 3-in.; Udamick (1917), 185 tons, 10 knots, 1 3-in.; Nos. I-VI (1935), 400 tons, 16 knots, 1 4-in., 1 m.g.; Lehna and Kuore (1937), ex-Finnish, 16 tons, 10 knots; Fugas, Kapsul, Paravan, Podsekateo, Provodnik, Strela, Patron, Bui, Tcheka, Gafel, Tros, Verp, Zapal, Vziriv, Kramhol (1933-40), 600 tons, 16 knots, 1 4-in., 1 1.7-in.; Keri, Vaindlo, 50 tons, 9 knots; Takhona, 45 tons, 2 knots. Many acquired from U.S. Navy and R.N.

ICE-BREAKERS.—Josef Stalin, Kaganovitch, A. Mikojan (1938-40), 11,000 tons, 15 knots, 3 seaplanes; Lenin, 5,700 tons, 19 knots; Krassin (1917), 10,000 tons, 15 knots; Sadko (1913), 1,616 tons, 14 knots; Maligin (1912), 1,535 tons; Sedov, Russinov, Sibiryakov (1909), 3,000 tons, 17 knots; Nos. I-VI (1935), 400 tons, 16 knots, 1 4-in., 1 m.g.; Lehna and Kuore (1937), ex-Finnish, 16 tons, 10 knots; Fugas, Kapsul, Paravan, Nikitich (1916), 1,684 tons; Krasni Gorn (1911), 1,892 tons, 11 knots; Serp-I-Molot (building); S. Makarov (1916), 4,000 tons, 14 knots; Yermak (1898), 8,000 tons, 14 knots; 30 others.

DEPTOR SHIPS.—Krasni Gorn (1911), 1,892 tons, 11 knots; Serp-I-Molot (building); S. Makarov (1916), 4,000 tons, 14 knots; Kommuna (1913), 2,400 tons, 10 knots; Sovetskaya Rossiya, 5,200 tons, 12 knots; Oka (1914), 1,982 tons, 10 knots; Soviet, Antoni, Krasny Moryak, Volga, 9,300 tons, Kronstadt, Angara, Terek, Isar and others.

TRAINING SHIPS.—Svir, 10,000 tons gross, 15 knots; Martinov, Osvoiaikhim, Artemev, Kursant, Ucheba, Praktika (1907), 300 tons; Konsomolets (1902), 11,000 tons, 18 knots, 4 3-in.; Amur, 3,000 tons, 13 knots, 1 4.7-in.; Leningrad Soviet (1895), 1,300 tons, 10 knots.

GUARDSHIPS.—Razvedchik (1904), 100 tons, 16 knots, 2 3-pr.; Dzerzhinski, Khrov (1934), 800 tons, 21 knots, 2 4-in., 4 1.5-in. A.A.; Five vessels, 200 tons, 16 knots, 1 4.7-in.; Eight vessels, 350 tons, 20 knots, 1 4.7-in.

WATERPATROLLERS.—Vodolei I and II, 660 tons, 9½ knots, 3 others. MOTOR-TORPEDO BOATS.—A large number of ex-U.S. PT. Boats.

PATROL VESSELS.—Khorek, Kunitsa, Laaska, Vidra (1936-37), 180 tons, 12 knots, 2 3-in.; 40 others. SURVEYING VESSELS.—Hydrografs (ex-Latvian), Okean, Okhotsk, Astronom, Zenit, Azimut and 24 others.

6 HOSPITAL SHIPS. FISHERY PROTECTION VESSELS.—Alvin, Gorislava. 5 SALVAGE VESSELS.

SUBMARINE CHASERS.—Many acquired from U.S.N.

SOVIET UNION.—FLOTILLAS.

Some of the details given below are uncertain

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	De-signed speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
FLOTILLA LEADERS—			Feet	Feet	Feet		Tons		Knots				Tons
Leningrad	Leningrad	1935	400	38½	14	2	1950	65,000	38	5 5·1-in., 2 3-in. A.A.	21-in.		
Minsk	"	1936	"	"	"	"	"	"	"	"	"		
Tbilisi	Vladivostok	1937	"	"	"	"	"	"	"	"	"		
Baku	"	1937	"	"	"	"	"	"	"	"	"		
Tomsk	"	1942	"	"	"	"	"	"	"	"	"		
Tashkent	"	1942	"	"	"	"	"	"	"	"	"		
DESTROYERS—													
— (Narvik type)	Bremen	1942	414½	39½		2	2600	70,000	37	5 5·9-in., 4 1·5-in.	8 21-in.		
— <i>ex-Z33</i>	"												
— (Roeder type)	Hamburg	1935	393½	37½		2	2360	70,000	38	5 5-in., 4 1·5-in.	8 21-in.		
— <i>ex-Z14</i>	"												
— (Roeder type)	"	1935	"	"	"	"	"	"	"	"	"		
— <i>ex-Z15</i>	"												
— (Roeder type)	Bremen	1938	385½	38½		"	2290	55,000	36	5 5-in., 4 1·5-in.	8 21-in.		
— <i>ex-Z20</i>	"												
— (Elbing)	Schichau	1942	337½	32½		"	1200	32,000	32	4 4-in., 4 1·5-in.	6 21-in.		
— <i>ex-T33</i>	"												
Likhal (Roumanian)	Naples	1928	334½	31½			1785	42,000	38	5 4·7-in., 1 3-in.	6 21-in.		
— <i>ex-Regele Ferdinand</i>	"												
Kotelnikov (Roumanian)	"	1924	"	"			"	"	"	"	"		
— <i>ex-Regina Maria</i>	"												
— <i>ex-Japanese</i>	Sasebo	1944	440	38	13	2	2300	52,000	33			300	
— Harutsuki	"												
— <i>ex-Japanese</i>	Maizuru	1932	389	34	10½	2	1800	50,000	34			226	
— Hibiki	"												
— <i>ex-Italian</i>	Odero-Terni	1937	350	29	12	2	1569	48,000	39	4 4·7-in., 1 40-mm.	6 21-in.	189	575
— Artigliere	Orlando												
— <i>ex-Italian</i>	C.N.R.A.	1938	"	"	"	"	"	"	"	"	"	"	525
— Fuciliere	Ancona												
— <i>ex-Italian</i>	Ansaldo	1916	340	32	12	2	1383	40,000	35	8 4-in., 8 20-mm.	6 21-in.	140	350
— Augusto Riboty	Genoa												
" O " Class :													
Obraztsovi	Bldg.						2000						
Otlichni	"												
Otvashni	"												
Ognevoi	"												
Opasni	"												
Ozarnoi	"												
Opytny	1941												
Improved Gordy Class :													
Silny	Leningrad	1938	370	33½		2	1650	40,000	37	4 5·1-in., 2 1·5-in. A.A.	6 21-in.		
Storozhevoi	"	1938	"	"		"	"	"	"	"	"		
Slavni	"	1939	"	"		"	"	"	"	"	"		
Drozd	"												
Optini	"												
Sposobni	"												
Strashni	"												
Strogi	"												
Stroini	"												
Sviryepti	"												
Razlastchi	"												
Volochevka	"												
Vnimatelni	"												
Vnoshitelni	"												
Gordy Class :													
Boikd	Nikolaev	1938	375	33½		2	1650	40,000	37	4 5·1-in., 2 1·5-in. A.A.	6 21-in.		
Gromki	"		"	"		"	"	"	"	"	"		
Grozny	"		"	"		"	"	"	"	"	"		
Gremyashchi	"		"	"		"	"	"	"	"	"		
Grozyashchi	"		"	"		"	"	"	"	"	"		
Goryaschi	"		"	"		"	"	"	"	"	"		
Bodry	"		"	"		"	"	"	"	"	"		
Rezevi	"	1939	"	"		"	"	"	"	"	"		
Riyani	"		"	"		"	"	"	"	"	"		
and about 10 others	"		"	"		"	"	"	"	"	"		

Soviet Union—continued.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	De-signed speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—contd.			Feet	Feet	Feet		Tons		Knots				Tons
<i>Town Class :</i>													
Dostoini	Newport News	1918	314	32	11	2	1100	26,000	35	1 4-in., 1 12-pr.	6 21-in.		
Zharky	Fore River	"	"	"	"	"	"	"	"	"	"	"	"
Zhyvuchi	Marg Island	"	"	"	"	"	"	"	"	"	"	"	"
Derzyki	Bath Iron	"	"	"	"	"	"	"	"	"	"	"	"
Zhguchi	N.Y.S.B.	"	"	"	"	"	"	"	"	"	"	"	"
Doblestni	Fore River	"	"	"	"	"	"	"	"	"	"	"	"
Zhostky	"	"	"	"	"	"	"	"	"	"	"	"	"
Druzhni	Wm. Cramp	"	"	"	"	"	"	"	"	"	"	"	"
<i>Uritsky Class :</i>													
Karl Liebknecht	Leningrad	1914	321	31	9-25	2	1610	32,000	29	4 4-in., 1 3-in.	9 18-in.	110	400
Uritsky	"	1914	321	31	10	2	1260	30,000	28	A.A., 2 M., 80 mines.	9 (T.)	"	"
Stalin	"	1914-	315	"	"	"	"	"	"	"	"	"	"
Voikov	"	15	"	"	"	"	"	"	"	"	"	"	"
<i>Shtorm Class :</i>													
Shtorm	Nikolaev	1932	236	24	10	2	700	13,200	29	2 4-in., 3 3-in., 2 M., 40 mines	9 18-in.	72	
Shkval	Leningrad	1933-	251	24	10	2	700	13,200	29	2 4-in., 3 3-in., 2 M., 40 mines	9 18-in.	72	
Groza	"	39	"	"	"	"	"	"	"	"	"	"	"
Metel	"	"	"	"	"	"	"	"	"	"	"	"	"
Smertsch	"	"	"	"	"	"	"	"	"	"	"	"	"
Uragan	"	"	"	"	"	"	"	"	"	"	"	"	"
Vyuga	"	"	"	"	"	"	"	"	"	"	"	"	"
Grom	"	"	"	"	"	"	"	"	"	"	"	"	"
Vikhr	"	"	"	"	"	"	"	"	"	"	"	"	"
Tucha	"	"	"	"	"	"	"	"	"	"	"	"	"
Molniya	Vladivostok	"	"	"	"	"	"	"	"	"	"	"	"
Zarnitza	"	"	"	"	"	"	"	"	"	"	"	"	"
Burun	Leningrad	"	"	"	"	"	"	"	"	"	"	"	"
and six others													
FRIGATES—													
<i>Tacoma Class (ex-U.S.N.) :</i>													
29 in number	U.S.A.	1943	285½	37½	10	2	1430	5500 (R)	20	3 3-in. H.A./L.A. 2 40-mm., 9 20-mm.			
SLOOP—													
(ex-H.M.S. Lark)	Scotts	1943	300	38½		2	1350	4300	20	6 4-in., 10 20- mm.			
GUARD SHIPS*—													
Dserschinski	Ansaldo	1934	250	27	9	3	800	5400	20	2 4-in., 4 1·5- in.	9 18-in.	120	44
Kirov and 30 others	Built in Russia	1901- 41	"	"	"	"	"	"	"	"	"	"	"
SUBMARINES—													
<i>Ex-German :</i>													
Type XXI (4 in number)	Germany	1944	251½	26	20½	2	Surf. 1621 1819	4000 5000	Surf. 15 16	4 A.A.	6 21-in.		
Type IXC (1 in number)	"	1942	252	22		2	1120 1232	4400 1000	18·3 7	1 40-mm., 4 20-mm.	6 21-in.		
Type VII B, VII C (4 in number)	"	1942	218	20		2	753 857	2310 750	17·9 8·0	1 40-mm., 4 20-mm.	6 21-in.		
Type XXIII	"	1944	113½	10		2	232 256	575 580	9 12		2 21-in.		
Type II B	"	1936	136½	13		2	250 295	700 360	13 7	1 20-mm.	3 21-in.		
<i>Pravda :</i>													
About 20 boats	Leningrad	1935- 41	320				1700	4000		2 4·1-in., 2 20- mm.	10 21-in.		
<i>"S" Class :</i>													
About 20 boats		1937- 40	250				1100	4000	18	1 4·1-in.	6 21-in.		
<i>"L" Class :</i>													
About 20 boats		1929- 36	240				1100	4000	18	1 4·1-in., 1 20- mm.	6 21-in.		
<i>"Schtech" Class :</i>													
About 60 boats		1934- 40	220				620 820	1600	13		6 21-in.		

* A number of old Torpedo Boats are used as guard ships.

Soviet Union—*continued.*

Name or number	Where built	Launched	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
SUBMARINES— <i>contd.</i> <i>Ex-Roumanian</i> 3 in number	Galatz	1941-43	224	19			585			1 4-in.	6 21-in.		Tons
<i>Ex-Finnish</i> 5 in number	Abo	1930-31											
Komissar	Leningrad	1916-17	223	14½	12-6	2	650 790	2600 900	16 9	2 6-pr., 1 M.G.	4 18-in.	33	40
Kommunar	"	"	"	"	"	"	"	"	"	"	"	"	"
Tovarisnch	"	"	"	"	"	"	"	"	"	"	"	"	"
Krasnoarmeets	"	"	"	"	"	"	"	"	"	"	"	"	"
Krasnoflotets	"	"	"	"	"	"	"	"	"	"	"	"	"
Bednyak	"	"	"	"	"	"	"	"	"	"	"	"	"
Proletari	"	"	"	"	"	"	"	"	"	"	"	"	"
Batrak	"	"	"	"	"	"	"	"	"	"	"	"	"
Rabochi	"	"	"	"	"	"	"	"	"	"	"	"	"
Aktivist	"	"	"	"	"	"	"	"	"	"	"	"	"
Politrak	"	"	"	"	"	"	"	"	"	"	"	"	"
Internationalist	"	"	"	"	"	"	"	"	"	"	"	"	"
Partizan	"	"	"	"	"	"	"	"	"	"	"	"	"
About 25 of other types		1930-35								1 4-in.			
L55 (<i>ex-British</i>)	Vickers	1917	230	24	13	2	870 1139	2400 1600	17 10	1 4-in., 1 M.G.	6 21-in.	28	78
Lembit (<i>ex-Estonian</i>)	"	1937	190	24½	11	2	620 820	1200 700	13½ 8½	1 1.57-in., 20 mines.	4 21-in.	40	

SPAIN.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power, type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel	
											Side	Deck	Guns	Torpedo tubes		Coal	Oil
cr.	Canarias	tons 10,000	ft. 636	ft. 64	ft. 17-4	90,000 P.T. (G.) Y.	Ferrol	1931	1934	£	in. 4 3	in. 1	8 8-in., 8 4-7-in. A.A., 8 2-pr. A.A.	12 21-in. (T.)	knots 33-0	tons —	785
cr.	Miguel de Cervantes	7475	579½	54	16½	80,000 P.T. (G.) Y.	Ferrol	1928	1930		3	1	8 6-in., 4 4-in. A.A., 2 3-pr., 1 M.	12 21-in. (T.)	33-0	—	580
cr.	Almirante Cervera							1925	1928								
cr.	Galicia, ex-Libertad (ex-Principe Alfonso)	4857	463	50	15½	25,500 P.T.	Ferrol	1920	1923		3-1½ 1½	3	6 6-in., 4 3-5 A.A., 4 M., 1 L.	21-in. (T.)	25-5	1200	404
cr.	Navarra, ex-Republ-ica (ex-Reina Victoria Eugenia)	4509	463	46	14½	45,000 (G.)	Ferrol	1922	1924		3	1	8 4-7-in., 10 37-mm., 8 20-mm.	6 21-in. (T.)	29	800	330
cr.	Mendes Nunes												4 4-in., 2 3-in. A.A., 2 M.		15	324	220
g.b.	Dato	1000	251½	33½	11½	1700 (T)	Cartagena	1923	1925				2 4-in., 2 3-in. A.A., 1 M.		"	—	"
g.b.	Canalejas	"	"	"	"	"	"	1923	1924				6 4-in., 8 40-mm. A.A., 6 20-mm. A.A.		"	—	"
g.b.	Canovas Del Castillo	1600	283	39½	10	5000 (T)	Cadiz	1923	1923				"		"	"	140
g.b.	Calvo Sotelo	"	"	"	"	"	"	1934	1938				"		"	"	"
g.b.	Hernan Cortes	1710	312	42		5000 (D)		1944	1947				"		"	"	261
g.b.	Pizarro	"	"	"	"	"		1944	1946				"		"	"	"
g.b.	Vasco Nunes de Balbao	"	"	"	"	"		1944	1947				"		"	"	"
g.b.	Martin Alonso Pinson	"	"	"	"	"		1944	1947				"		"	"	"
g.b.	Magallanes	"	"	"	"	"		1944	1948				"		"	"	"
g.b.	Vicente Yanes Pinson	"	"	"	"	"		1945	1948				"		"	"	"
g.b.	Sacramento de Galbos	"	"	"	"	"		"	"				"		"	"	"
g.b.	Legaspi	"	"	"	"	"		"	"				"		"	"	"

SAILING TRAINING SHIPS.—Juan Sebastian de Elcano (1928), 3,500 tons, 800 H.P. (Diesel), 9-5 knots, 4 2-4-in.; Galatea (ex-Clara-stella) (1903), 2,710 tons, 8½ knots, 4 2-24-in. TRAINING SHIPS.—Virgen de La Caridad, Contramaestre Castello; Juan de Austria, 3,670 tons, 4 1-85-in. (Bldg.).

OILER.—Pluton, 7,000 tons, 13 knots. Two building.

ARMED TRAWLERS.—Alcazar, Larache and Tetuan, 400 tons, 10 knots, 1 3-in. (also 2 3-pr. in Alcazar); Arcila, 510 tons, 10½ knots, 2 3-in.; Uad Martin, 490 tons, 10 knots, 1 3-in.; Uad Quert, Xauen, 650 tons, 10½ knots, 1 3-in.; Finisterre, 236 tons; Alhucemas.

FISHERY PROTECTION VESSELS.—8 in number, 150 tons, 11 knots, 1 6-pr.

MINELAYERS.—Jupiter, Marte, Neptuneo, Vulcano, 2,100 tons, 18½ knots, 4 4-7-in. A.A., 2 3-in., 4 1-6-in. A.A., 4 M.G., 264 mines, 2 depth charge release gears; Eolo, Triton, 1500 tons, 19 knots, 4 4-in., 4 1-5-in., 4 M.G., 100 mines.

TUGS.—R.R.12 (ex-Cartagenero), Ferrolano, R.R.14 (ex-Gaditano), 300 tons, 10 knots, 1 6-pr.; R.R.11 (ex-Galicia), 350 tons, 10 knots, 1 3-in.; R.A.1 (ex-Ciclope), 800 tons, 12 knots; 1 3-in. R.P. 21-27. Many more building.

MINESWEEPERS.—Bidasoa, Guadalete, Lerez, Nervion, Segura, Tambre, Ter, 615 tons, 17 knots, 1 4-in., 2 37-mm., 2 20-mm.; and 5 more building.

CABLE SHIP.—Castillo Olmedo, 1,440 tons.

Spain.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel	
			Length (extreme)	Beam	Draught								Coal	Oil
DESTROYERS—			Feet	Feet	Feet		Tons		Knots					Tons
<i>Oquendo Class :</i>														
Oquendo	Ferrol	Bldg.	382	36			1950	60,000	39	8 4-1-in. A.A., 12 40-mm.	6 21-in.			
Roger da Lauria	"	"	"	"	"	"	"	"	"	"	"			
Marques d' Fnsenada	"	"	"	"	"	"	"	"	"	"	"			
Blas de Lezo	"	"	"	"	"	"	"	"	"	"	"			
Gelmirez	"	"	"	"	"	"	"	"	"	"	"			
Langara	"	"	"	"	"	"	"	"	"	"	"			
Bonifaz	"	"	"	"	"	"	"	"	"	"	"			
Recalde	"	"	"	"	"	"	"	"	"	"	"			
Blasco de Garay	"	"	"	"	"	"	"	"	"	"	"			
<i>Audaz Class :</i>														
Audaz	"	"	312	30½			1100	28,000	33	3 4-1-in., 4 40-mm.	6 21-in.			
Osado	"	"	"	"	"	"	"	"	"	"	"			
Atrevido	"	"	"	"	"	"	"	"	"	"	"			
Rayo	"	"	"	"	"	"	"	"	"	"	"			
Furor	"	"	"	"	"	"	"	"	"	"	"			
Ariete	"	"	"	"	"	"	"	"	"	"	"			
Temerario	"	"	"	"	"	"	"	"	"	"	"			
Intrepido	"	"	"	"	"	"	"	"	"	"	"			
Relampago	"	"	"	"	"	"	"	"	"	"	"			
<i>Alava Class :</i>														
Alava	Cartagena	1947	333	31·7	14	2	1650	42,000	36	4 4·7-in., 2 40-mm.	"	198		
Liniers	"	1946	"	"	"	"	"	"	"	"	"			
<i>Churrucua Class :</i>														
Gravina	"	1931	"	"	10·5	"	1536	"	"	5 4·7-in., 1 3-in. A.A., 4 M. (some have 4 4·7-in.)	6 21-in. (T.)	175	—	540
Escano	"	1932	"	"	"	"	"	"	"	"	"	"	"	"
Ciscar	"	1933	"	"	"	"	"	"	"	"	"	"	"	"
Jorge Juan	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Ulloa	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Almirante Valdés	"	1930	"	"	"	"	"	"	"	"	"	"	"	"
Almirante Antequera	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Almirante Miranda	"	1931	"	"	"	"	"	"	"	"	"	"	"	"
Churrucua	"	1929	"	"	"	"	"	"	"	"	"	"	"	"
Alcala Galiano	"	1930	"	"	"	"	"	"	"	4 4·7-in., 2 40-mm.	"	"	"	"
Lepanto	"	1928	"	"	"	"	"	"	"	"	"	"	"	"
José Luis Díez	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Sanchez-Barcaiztegui	"	1926	"	"	"	"	"	"	"	"	"	"	"	"
<i>Alsedo Class :</i>														
Lazaga	"	1924	283	27	9	2	1044	33,000	34	3 4-in., 2 1·46-in. A.A.	4 21-in. (D.)	70	—	265
Valeseo	"	1923	"	"	"	"	"	"	"	"	"	"	"	"
Alsedo	"	1922	"	"	"	"	"	"	"	"	"	"	"	"
Ceuta	Naples	1920	310	31	10	2	1706	40,000	34	4 4·7-in., 2 3-in., 2 M.	4 17·7-in. (D.)	139	—	260
Melilla	"	"	"	"	"	"	"	"	"	"	"	"	"	"
TORPEDO BOATS—														
Huesca (ex-Italian)	Ansaldo	1915	268	26	8	2	850	20,000	32	2 4-in., 2 1·57-in. A.A., 2 M.	2 17·7-in. (D.)	99	—	250
T 7, 14, 17	Cartagena	1913-22	164	16·5	6½	3	187	3750	26	3 1·85-in. A.A.	3 18-in.	31	—	33
							Surf. Sub.		Surf. Sub.					
SUBMARINES—														
D1, 2, 3	"	1944 Bldg.	276	21·8	13	2	1050 1375	5000 1350	20·5 9·5	1 4·7-in., 4 M.	6 21-in.			
C 2	"	1928-29	247	20·8	13·5	2	900 1270	2000 750	16 8·5	1 3-in. A.A.	6 21-in.	40	200	
B 2	"	1921-24	210	18·9	11·25	2	560 830	1400 850	16 10·5	1 3-in. A.A.	4 18-in.	28	—	66
General Mola (ex-Italian)	Taranto	1934	231·5	22·5	13	2	880 1230	3000 1300	17 8·5	2 3·9-in., 2 M.G.	8 21-in.	48	150	
General Sanjurjo (ex-Italian)	"	"	"	"	"	"	"	"	"	"	"	"	"	"
G 1, 2, 3, 4, 5, 6	Cartagena	Bldg.					646 784			1 3·5-in., 1 20-mm.	5 21-in.			
G 7 (ex-U 573)	Hamburg	1942	220	20			883							

SWEDEN.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power Type of machinery	Where built	Date of launch	Date of completion	Cost	Armour					Armament		Speed	Fuel	Com- ple- ment
											Belt	Deck above belt	Side Dulk-head	Gun position Heavy Guns	Secondary	Guns	Torpedo tubes			
Lcr.	Tre Kronor Göta Lejon	tons 7500	ft. 591	ft. 54	ft. 54	100,000 "	Gotaverken Eriksberg	1944/1946 1945/1947		£	in. 3-5	in.	in.	in.	in.	7 6-in., 20 40-mm. 25 20-mm.	9 21-in.	knots 33	tons Coal	580 "
Lcr.	Fylgia	4200	378	48-6	20-6	12,444 Y. f	Stockholm	1905/1907		385,700	4 K.S.	2		5 K.S.	5 K.S.	8 6-in., 4 2-2-in., 4 7-5-in.	2 21-in.	22-7	900	328
Lcr.	Gotland †	4700	442	50-6	14-7	39,000 (G.)	Gothenburg	1933/1934		910,000 (estimated)						6 6-in., 4 3-in. A.A., 10 40-mm., 100 mines.	6 21-in. (T.)	27-0	oil	453
c.d.s.	Drottning- Victoria *	7100	396-7	61	21½	22,000 (G.) Y.	Gothenburg	1917/1921		668,000	8-6 K.S.	1½	4 H.S.	8 K.S.	5 K.S.	4 7-1-in., 4 5-9-in., 4 3-in., 2 6-pr., 6 M.	—	23-0	890 98	540
c.d.s.	Gustav V *	7100	396-7	61	21½	22,000 (G.) Y.	Malmö	1918/1922		668,000	8-6 K.S.	1½	4 H.S.	8 K.S.	5 K.S.	4 7-1-in., 6 5-9-in., 4 3-in. A.A., 2 6-pr., 6 M.	—	23-0	690 98	540
c.d.s.	Manligheten	3361	287	49½	17-4	7400 Y.	Malmö	1903/1904			7 K.S.	1½		7½ K.S.	5 K.S.	2 8-3-in., 6 5-9-in., 8 6-pr., 1 7-pr.	2 sub. 18-in.	17-0	300	300
c.d.s.	Oscar II *	4250	313-6	50-5	18	9000 Y.	Gothenburg	1905/1907		..	6 K.S.	2	6 K.S.	7½ K.S.	5 K.S.	2 8-3-in., 8 5-9-in., 8 6-pr., 1 7-pr.	2 sub. 18-in.	18-0	500 —	330

* Reconstructed and modernised (1939).

† Reconstructed as A.A. ship from a hangar cruiser.

SWEDEN—continued.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power Type of machinery	Where built	Date of launch	Cost	Armour				Armament		Speed	Fuel		Com- ple- ment
										Belt	Deck	Side Bulk-head	Gun position	Guns	Torpedo tubes		Coal	Oil	
c.d.s.	<i>Sverige</i> *	tons 6899	ft. 392.7	ft. 61	ft. 21½	20,000 tur. Y.	Gothenburg	1915/1917	£ 660,000	in. 8-6 K.S.	in. 1½	in. 4 K.S.	in. 8 K.S.	in. 5 K.S.	4 17-in., 6 5.9-in., 4 3-in., 2 6-pr., 6 M.	—	knots 22.5	tons 680	540
c.d.s.	<i>Tapperheten</i>	3361	287	49½	17.7	8000 (R) Y.	Malmö	1901/1903	..	7 K.S.	1½	..	7½ K.S.	5 K.S.	2 8.3-in., 6 5.9-in., 10 6-pr., 1 1-pr.	2 sub. 21-in.	16.5	300	287
c.d.s.	<i>Aran</i>	"	"	"	"	"	Gothenburg	1901/1902	"	"	"	"	"	"	"	"	"	"	"

* Reconstructed and modernised (1938-40).

MINELAYERS.—Aelvsnabben, 3,750 tons, 4 6-in., 14 knots; Clas Fleming, 1,570 tons, 4 4.7-in., 4 M., 20 knots, 200 mines.
DEPOT SHIPS FOR SUBMARINES.—Patricia (1926), 3,000 tons, 14 knots; Dristigheten (1901), 3,218 tons, 16 knots, 4 3-in., 3 aircraft.
ICEBREAKERS.—Atle, 1,720 tons, 16 knots, 2 2.2-in.; Ymer, 3,450 tons, 18 knots, 4 3-in. Three building.
DEPOT SHIPS.—Jacob Bagge, Örnén, 738 tons, 20 knots, 2 4.7-in., 2 2.2-in.; Marieholm (1934), 1,116 tons, 12 knots, 1 1.57-in.
SAILING TRAINING SHIPS.—Jarramas (1900), 350 tons.

TRAINING SHIPS.—Regulus, 105 tons, 25 knots; Prins Carl (1931), 1,387 tons, 13 knots.
VEDETTE BOATS (used for minelaying and minesweeping).—Kaparen, Jagaren, Snapphanen, Vaktaren, 280 tons, 24 knots, 2 3-in., 2 1-in. A.A.; Altria, Astrea, Antares, Iris, Persens, 5-9 (1907), 50 tons, 11 knots, 1 1.5-in., 2 18-in. T.T.

Polaris, Spica, Thetis (1908-11), 105 tons, 25 knots, 2 2.2-in., 1 18-in. T.T.; No. 19 (1914), 55 tons, 10 knots; Nos. 27, 28, 30, 33, 34, 35, 36 (1900), 50 tons, 17 knots, 2 1.5-in., 1 15-in. T.T.; Nos. 5-9 (1907), 50 tons, 11 knots, 1 1.5-in., 2 18-in. T.T.

SALVAGE VESSEL.—Belos.

TENDERS.—Sökaren, Sveparen, Sprängaren, 160 tons, 10 knots, 1 6-pr.

MOTOR TORPEDO BOATS.—Nos. 3 and 4, 55 ft., 25 tons, 2,200 H.P., 41 knots, 1 M., 2 18-in. T.T.; T 11, 12, 13, 14 (ex-Italian), 20 tons, 47 knots, 2 T.T.; T 15-18 (1941), 34 tons, 2 T.T., 18-in. T 19-22, 34 tons, several others building.

MINESWEEPERS.—Starkodder, Styrbjörn, 350 tons, 15 knots, 2 1.5-in.; M. 1 and 2, 60 tons, 16½ knots, 2 M.C.; Bremön, Holmon, Grönskar, Koster, Kullen, Ramskar, Sandön, Bredskär, Orskar, Ven, Vingö, Ulvön (1941), 17 knots, 2 4.3-in., 1 1-in. A.A.; Arholma, Landsort (1939), 365 tons, 17½ knots, 2 4-in.; M. 3-M. 14 (1939), 50 tons, 13 knots, 1 20-mm.; M. 15-M. 26 (1942), 60 tons, 13 knots, 1 20-mm.

SURVEYING VESSELS.—Gustaf Af Flint, Kompass, Johan Nordenfjær, Peter Gedda, Ejder, Svensksund, Svalan, Ran (1945).

OTHERS.—Brännaren (1833), 1,062 tons, 10 knots; Oljaren, Eldaren, 9 knots, 2 1-in.

Sweden.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel Coal Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
<i>Landscape Class :</i>													
Oland	Malmö	1945	340	36	11½	2	1800	45,000	35	4 4·7-in., 40-mm.	6 21-in.		
Uppland and 2 other projected	Karlskrona	1946	"	"	"	"	"	"	"	"	"		
<i>Sundsvall Class:</i>													
Sundsvall	Eriksberg	1943	320	29·5	9	2	1135	36,000	39	3 4·7-in., 6 40- mm.	6 21-in. (T)	140	
Kalmar	"	"	"	"	"	"	"	"	"	"	"	"	"
Visby	Gotaverken	"	"	"	"	"	"	"	"	"	"	"	"
Halsingborg	"	"	"	"	"	"	"	"	"	"	"	"	"
<i>Malmö Class :</i>													
Gävle	"	1940	304	29·5	12·5	2	1020	32,000	39	3 4·7-in., 4 1-in.	6 21-in.	131	— 150
Norrköping	"	"	"	"	"	"	"	"	"	"	"	"	"
Karlskrona	Karlskrona	1939	"	"	"	"	"	"	"	"	"	"	"
Stockholm	"	1936	"	"	"	"	"	"	"	"	"	"	"
Malmö	Göteborg	1938	"	"	"	"	"	"	"	"	"	"	"
Göteborg	"	1935	"	"	"	"	"	"	"	"	"	"	"
TORPEDO BOATS—													
Eight in number projected													
Klas Horn	Malmö	1931	304·2	29·2	10·5	2	1000	24,000	35	3 4·7-in., 2 2- pr. A.A., 2 M.	6 21-in. (T)	125	— 150
Ehrensköld	Göteborg	1926	"	"	"	"	"	"	"	"	"	"	"
Nordenskjöld	Malmö	"	"	"	"	"	"	"	"	"	"	"	"
*Mode	Gothenburg	1942	243	26·4	9·5	2	635	"	"	3 4-in.	3 21-in.	"	"
*Magne	"	"	"	"	"	"	"	"	"	"	"	"	"
*Munin	"	"	"	"	"	"	"	"	"	"	"	"	"
*Mjolner	"	"	"	"	"	"	"	"	"	"	"	"	"
†Romulus (ex-Spica)	Naples	1934	263·6	26·9	7·4	2	638	19,000	34	3 3·9-in., 6 1·5- in. A.A.	4 17·7-in.	"	"
†Remus (ex-Astore)	"	"	"	"	"	"	"	"	"	"	"	"	"
†Puke (ex-Ricasoli)	"	1926	278·6	28·2	8·7	2	935	36,000	35	4 4·7-in., 2 1·5- in. A.A., 2 M., 40 mines.	4 21-in.	106	— 200
†Psilander (ex-Nicotera)	"	"	"	"	"	"	"	"	"	"	"	"	"
*Wrangel	Gothenburg	1917	232·8	22	9·2	2	458	11,000	34·0	4 3-in., 2 M.	6 18-in.	72	107 6
*Wachtmeister	"	"	"	"	"	"	"	"	"	"	"	"	80 3
*Ragnar	Malmö	1909	216	20·8	9	2	354	8000- 9000	30·0	4 3-in. 2 M.	2 18-in. (D.)	67	" "
*Sigurd	Gothenburg	"	"	"	"	"	"	"	"	"	"	"	"
*Vidar	Malmö	"	"	"	"	"	"	"	"	"	"	"	"
*Hugin	Gothenburg	"	"	"	"	"	"	"	"	"	"	"	"
ESCORT VESSELS—													
Granat		1925	121½	23	14		440		10	1 2·24-in.			
Harpun		"	"	"	"		"		"	"			
SUBMARINES—													
<i>1st Class—</i>													
Dykaren	Kockum,	1940	204	20·5	11	2	650	2000	15	1 4-in., 2 M.	6	32	
Sjoberren	Malmö	1941	"	"	"	"	760	—	10	"	21-in.	"	
Sjohasten	"	1940	"	"	"	"	"	"	"	"	"	"	
Sjoormen	"	1941	"	"	"	"	"	"	"	"	"	"	
Svardfisken	"	1940	"	"	"	"	"	"	"	"	"	"	
Tumlaren	"	1941	"	"	"	"	"	"	"	"	"	"	
Sjolejonet	"	1936	"	"	"	"	"	"	"	"	"	"	
Sjobjornen	"	1938	204	20½	11	2	600		15	1 4-in., 2 M.G.	"	32	
Sjohunden	"	"	"	"	"	"	760		10	"	"	"	
Nackan	"	1942	"	"	"	"	"	"	"	"	4	"	
Najad	"	"	"	"	"	"	"	"	"	"	21-in.	"	
Neptun	"	"	"	"	"	"	"	"	"	"	"	"	
Nordkaparen	"	1935	199	20½	11	2	500		15	1 4-in.	4	"	
Delfinen	Göteborg	"	"	"	"	"	720		10	"	21-in.	28	
Springaren	Kockum,	"	"	"	"	"	"	"	"	"	"	"	
	Malmö	"	"	"	"	"	"	"	"	"	"	"	
Draken	Naval Yard, Karlskrona	1926	213	21	10·8		700	2800	16	1 4-in., 1 M.	4	32	— 40
Gripen	"	1928	"	"	"		850	—	9	"	20-in.	"	
*Valen	"	1925	186	23·2	9·4		492		15	1 3-in., 1 M.	4	"	— 34
							650		9	"	18-in.	"	
COASTAL													
SUBMARINES—													
U1, U2, U4-9	Kockum, Malmö	1941- 44	164	14		"	367			1 2·24-in., 1 M.	4 21-in.	25	
U3	Karlskrona	1942	"	"		"	"			"	"	"	

* Fitted for minelaying.

† Ex-Italian.

UNITED STATES.—BATTLESHIPS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery	Where built	Date of launch	Date of completion	Cost	Armour					Armament		Speed knots	Fuel Oil tons	Complement
											Belt	Deck above belt	Side Bulk-head	Heavy guns	Gun position Secondary					
b.	Kentucky †	45,000	887½	108	36	200,000 C.T.(G.)	Norfolk N.Y.	Blg. 1942	1943	25,000,000	in.	in.	in.	in.	in.	9 16-in. guns, 20 5-in., many smaller A.A. guns, 4 aircraft, 2 catapults.		30	2700	
b.	Lowa	"	"	"	"	"	New York N.Y.	1942	1943	"								"	"	"
b.	New Jersey	"	"	"	"	"	Philadelphia N.Y.	1942	1943	"								"	"	"
b.	Missouri	"	"	"	"	"	New York N.Y.	1944	1944	"						"		"	"	"
b.	Wisconsin	"	"	"	"	"	Philadelphia N.Y.	1943	1944	"						"		"	"	"
b.	Indiana	35,000	680	108	29½	115,000 tur.	Newport News Bethlehem	1941	1942	17,500,000						9 16-in. guns, 20 5-in. many smaller, 3 air- craft, 2 catapults. (S. Dakota has 16 5-in. guns.)		27	2500	
b.	Massachusetts	"	"	"	"	"	(S.B. Co.)	1941	1942	"								"	"	"
b.	Alabama	"	"	"	"	"	Norfolk N.Y.	1942	1942	"								"	"	"
b.	South Dakota	"	"	"	"	"	New York (S.B. Co.)	1941	1942	"								"	"	"
b.	Washington	"	729	108	28	"	Philadelphia N.Y.	1940	1941	"						"		"	"	"
b.	North Carolina	"	"	"	"	"	New York N.Y.	1940	1941	"						"		"	"	"
b.	West Virginia *	31,800	624	97½	30	27,300 B. & W. tur. electric drive	Newport News	1921	1923	1,383,000	13½-1 K.S.			18 K.S.		8 16-in. (45 cal.), 16 5-in. (58 cal.), A.A., many small A.A., 2 catapults, 3 float- planes.	—	21-0	4570	2350
b.	Colorado *	32,600	624	97½	30½	27,300 B. & W. tur. electric drive	New York (S.B. Co.)	1921	1923	1,383,000	13½-13 K.S.			18 K.S.		8 16-in. (45 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., many small A.A., 2 cata- pults, 3 floatplanes.	2 (sub.) 21-in.	21-0	4570	2200

* Bulged: West Virginia was completely rebuilt at Puget Sound 1943-4.

† Kentucky and Hawaii are to have a main armament of rocket projectors and rockets.

UNITED STATES.—BATTLESHIPS—continued.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour					Armament		Speed	Fuel Oil	Complement
											Belt	Deck	Side above belt	Gun position	Heavy guns	Secondary	Guns				Torpedo tubes
b.	Maryland *	tons 31,500	ft. 624	ft. 97½	ft. 29¾	27,300 B. & W. tur. (G.) and electric drive	Newport News	1920	1921	£ 1,383,000	in. 13½ -12 K.S.	in.	in.	in.	in.	8 16-in. (45 cal.), 10 5-in. (51 cal.), 8 5-in. (38 cal.) A.A., many small A.A., 2 cata- pults, 3 floatplanes.	—	knots 21	tons 4570	2100
b.	Tennessee †	32,300	624	97½	30½	34,800 B. & W. Tur. electric drive	New York (Navy Yard)	1919	1920	2,620,000	14-8 K.S.	3	in.	18 K.S.	18 K.S.	12 14-in. (50 cal.), 16 5-in. (38 cal.), many small A.A., 2 cata- pults, 3 floatplanes.	—	21.0	4656	
b.	California ‡	32,600	624	97½	30½	26,800 tur. electric drive	Mare Island (Navy Yard)	1919	1921	2,620,000	14-8 K.S.	3	..	18 K.S.	..	12 14-in. (50 cal.), 16 5-in. (38 cal.), many small A.A., 2 cata- pults, 3 floatplanes.	—	21	4656	2200
b.	New Mexico §	33,400	624	106½	29½	32,000 T. (G.) drive	New York (Navy Yard)	1917	1918	1,485,000	14 K.S.	3	3	18 K.S.	18 K.S.	12 14-in. (50 cal.), 6 5-in. (51 cal.), 8 5-in. A.A., 2 6-pr., many small A.A., 3 float- planes.	—	21	3271	1930
b.	Mississippi §	33,000	624	106½	29½	32,000 B. & W. C.T. (G.)	Newport News	1917	1917	1,485,000	14 K.S.	3	3	18 K.S.	18 K.S.	12 14-in. (50 cal.), 6 5-in. (51 cal.), 8 5-in. A.A., many small A.A., 2 catapults, 3 floatplanes.	—	21	3271	1930
b.	Idaho §	33,400	624	106½	29½	32,000 B. & W. P.T. (G.)	New York (S.B. Co.)	1917	1919	1,485,000	14 K.S.	3	3	18 K.S.	18 K.S.	12 14-in. (50 cal.), 6 5-in. (51 cal.), 8 5-in. A.A., many small A.A., 2 catapults, 3 floatplanes.	—	21½	3271	1930

b.c.	Alaska	27,500	808½	89½	150,000	New York (S.B. Co.)	1943 1944									9 12-in. (50 cal.) 12 5-in. (38 cal.) 4 Aircraft 2 Catapults	80	1500
b.c.	Guam	"	"	"	B. & W. T.(G.)	"	1943 1944									"	"	"
b.c.	Hawaii ||	"	"	"	"	"	1945 Bldg.									"	"	"

* Bulged.

† Rebuilt at Bremerton 1942-43. Training battleship.

‡ Rebuilt 1942-43.

§ Rebuilt 1930-34: protection increased, bulges fitted, new turbines fitted (New Mexico originally had electric drive).

|| See note on page 135.

The sums given in the cost column are exclusive of the cost of armour and armament according to the system of making appropriations in the estimates.

UNITED STATES.—AIRCRAFT CARRIERS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel Oil	Complement
											Deck	Belt	Guns	Torpedo tubes			
		tons	ft.	ft.	ft.					£	in.	in.			knots	tons	
	Midway Class—																
a.c.	Midway	45,000	988	113		200,000	Newport News	1945	1945				18 5-in. (54 cal.), —40-mm., operates approx. 100 aircraft.		33		3000
a.c.	Franklin D. Roosevelt	"	"	"		"	New York	1945	1945						"	"	"
a.c.	Coral Sea	"	"	"		"	N.Y.								"	"	"
	Essex Class—																
a.c.	Essex	27,100	860	93		150,000 T.G.	Newport News	1942	1942				12 5-in. (38 cal.), operates approx. 80 aircraft.		32		2500
a.c.	Yorktown	"	"	"		"	"	1943	1943				"		"	"	"
a.c.	Intrepid	"	"	"		"	"	"	"				"		"	"	"
a.c.	Franklin	"	"	"		"	"	"	1844				"		"	"	"
a.c.	Hornet	"	"	"		"	"	"	1943				"		"	"	"
a.c.	Thunderbolt	"	"	"		"	"	1944	1944				"		"	"	"
a.c.	Randolph	"	"	"		"	"	"	"				"		"	"	"
a.c.	Boxer	"	"	"		"	"	"	1945				"		"	"	"
a.c.	Leyte	"	"	"		"	"	1945	1946				"		"	"	"
a.c.	Bunker Hill	"	"	"		"	Bethlehem	1942	1943				"		"	"	"
a.c.	Wasp	"	"	"		"	"	1943	"				"		"	"	"
a.c.	Hancock	"	"	"		"	"	1944	1944				"		"	"	"
a.c.	Bennington	"	"	"		"	New York	1945	1946				"		"	"	"
a.c.	Kearsarge	"	"	"		"	N.Y.	1945	1945				"		"	"	"
a.c.	Orikan	"	"	"		"	"	1944	1945				"		"	"	"
a.c.	Ben Hornes	"	"	"		"	"						"		"	"	"
a.c.	Richard	"	"	"		"	Norfolk N.Y.	1944	1944				"		"	"	"
a.c.	Shangri-la	"	"	"		"	"	1945	1946				"		"	"	"
a.c.	Turawa	"	"	"		"	"						"		"	"	"

UNITED STATES.—AIRCRAFT CARRIERS—*continued.*

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Armour		Speed	Fuel Oil	Complement
										Deck	Belt			
	Casablanca Class		ft.	ft.	ft.					£	in.	in.	knots	tons
	<i>(contd.)</i>													
e.c.	Petrol Bay	7,800	512	65		11,200 (R.)	Kaiser Co.	1943	1944			18		800
e.c.	Rudyerd Bay	"	"	"		"	"	1944	1944			"	"	"
e.c.	Saginaw Bay	"	"	"		"	"	"	"			"	"	"
e.c.	Sargent Bay	"	"	"		"	"	"	"			"	"	"
e.c.	Shamrock Bay	"	"	"		"	"	"	"			"	"	"
e.c.	Shipley Bay	"	"	"		"	"	"	"			"	"	"
e.c.	Sitkoh Bay	"	"	"		"	"	"	"			"	"	"
e.c.	Steamer Bay	"	"	"		"	"	"	"			"	"	"
e.c.	Cape Esperance	"	"	"		"	"	"	"			"	"	"
e.c.	Takanis Bay	"	"	"		"	"	"	"			"	"	"
e.c.	Thetis Bay	"	"	"		"	"	"	"			"	"	"
e.c.	Makassar Strait	"	"	"		"	"	"	"			"	"	"
e.c.	Windham Bay	"	"	"		"	"	"	"			"	"	"
e.c.	Lunga Point	"	"	"		"	"	"	"			"	"	"
e.c.	Hollandia	"	"	"		"	"	"	"			"	"	"
e.c.	Kwajalein	"	"	"		"	"	"	"			"	"	"
e.c.	Bougainville	"	"	"		"	"	"	"			"	"	"
e.c.	Matanikan	"	"	"		"	"	"	"			"	"	"
e.c.	Munda	"	"	"		"	"	"	"			"	"	"
	—													
	Commencement Bay Class—													
e.c.	Commencement Bay	12,000	553	75		16,000	Todd, Tacoma	1944	1944			18		1000
e.c.	Block Island	"	"	"		"	"	"	"			"	"	"
e.c.	Gilbert Islands	"	"	"		"	"	"	"			"	"	"
e.c.	Cape Gloucester	"	"	"		"	"	"	"			"	"	"
e.c.	Vella Gulf	"	"	"		"	"	"	"			"	"	"
e.c.	Kula Gulf	"	"	"		"	"	"	"			"	"	"
e.c.	Siboney	"	"	"		"	"	"	"			"	"	"
e.c.	Salerno Bay	"	"	"		"	"	"	"			"	"	"

UNITED STATES.—CRUISERS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power, Type of machinery and boilers	Where built	Date of launch	Date of completion	Armour		Armament		Speed	Fuel Oil	Complement
										Belt	Deck	Gun position	Guns	Torpedo tubes		
Des Moines Class	Des Moines	tons 17,000	ft. 716½	ft. 75½	ft.	120,000		1946	1948	in. 6-8	in.		9 8-in. (50 cal.), 12 5-in. (38 cal.), many 40-mm. (ultimately to be 3-in.), 4 aircraft, 2 catapults.		tons 2670	
	Salem	" "	" "	" "	" "	" "		1947	1949	3 and 2						
	Newport News	" "	" "	" "	" "	" "		" "	" "	" "						
Modified Baltimore Class	Oregon City	13,700	673½	69½		120,000	Bethlehem	1945	1946	6			9 8-in. (50 cal.), 12 5-in. (38 cal.), many 40-mm. (ultimately to be 3-in.), 4 aircraft, 2 catapults.		2500	
	Albany	" "	" "	" "	" "	" "	" "	" "	" "	3 and 2			9 8-in. (50 cal.), 12 5-in. (38 cal.), many 40-mm. (ultimately to be 3-in.), 4 aircraft, 2 catapults.			
	Rochester	" "	" "	" "	" "	" "	" "	" "	" "	" "			5-in. guns, 3-in. A.A. and smaller.			
Task Force Command Ship	Northampton	13,700	673½	69½		120,000	"	Bldg.		"				33		
Baltimore Class	Baltimore	13,600	673½	69½		120,000	Bethlehem	1942	1943				9 8-in. (50 cal.), 12 5-in. (38 cal.), many light A.A., 4 aircraft, 2 catapults.	33	2500	1500
	Boston	" "	" "	" "	" "	" "	(Quincy)	"	"					"	"	"
	Camberra	" "	" "	" "	" "	" "	" "	1943	"					"	"	"
	Quincy	" "	" "	" "	" "	" "	" "	"	"					"	"	"
	Pittsburgh	" "	" "	" "	" "	" "	" "	1944	"					"	"	"
	Saint Paul	" "	" "	" "	" "	" "	" "	"	1944					"	"	"
	Columbus	" "	" "	" "	" "	" "	" "	"	1945					"	"	"
	Helena	" "	" "	" "	" "	" "	" "	"	"					"	"	"
	Brenerton	" "	" "	" "	" "	" "	New York	1945	"					"	"	"
	Fall River	" "	" "	" "	" "	" "	S.E. Co.	1944	1945					"	"	"
	Macon	" "	" "	" "	" "	" "	" "	"	"					"	"	"
	Toledo	" "	" "	" "	" "	" "	" "	"	1945					"	"	"
	Los Angeles	" "	" "	" "	" "	" "	Philadelphia	1944	1945					"	"	"
	Chicago	" "	" "	" "	" "	" "	N. Y.	"	"					"	"	"
Wichita Class	Wichita	10,000	614	61½	19½	100,000 (G.)	Philadelphia Navy Yard	1937	1939				9 8-in., 8 5-in. A.A., many small A.A., 2 catapults, 4 aircraft.	32½	1650	1200

UNITED STATES.—CRUISERS—continued.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power, type of machinery and boilers	Where built	Date of launch	Date of completion	Cost (exclusive of armament)	Armour		Armament		Speed	Fuel Oil	Complement
											Belt	Gun position	Guns	Torpedo tubes			
Brooklyn Class	Savannah	tons 9,700	ft. "	ft. 61½	ft. 19½	"	N.Y.S. Co., Camden	1887	1888	£ 2,410,000 estimated	in. 5	in.	15 6-in., 8 5-in. A.A., many small A.A., 4 seaplanes, 2 catapults.		knots 32½	tons 2100	1200
	*Nashville	"	"	"	"	"	N.Y.S. Co., Camden	1887	1888	"	"	"	"		"	"	"
	Brooklyn	"	"	"	"	"	New York Navy Yard Philadelphia	1887	1888	"	"	"	"		"	"	"
	Philadelphia	"	"	"	"	"	Navy Yard Philadelphia	1887	1888	"	"	"	"		"	"	"
	*Phoenix	"	"	"	"	"	Navy Yard N.Y.S. Co., Camden	1888	1888	2,395,000	"	"	"		"	"	"
San Diego Class	*Boise	"	"	"	"	"	Newport	1886	1888	2,330,000	"	"	"		"	"	"
	Honolulu	"	"	"	"	"	New York Navy Yard	1887	1888	"	"	"	"		"	"	"
	*St. Louis	"	"	"	"	"	Newport	1888	1888	"	"	"	"		"	"	"
	Spokane	6000	541	52½	16½	75,000	Kearny	1945	1947				16 5-in., many light, 40-mm., 3 aircraft.		33		700
	Fresno	"	"	"	"	"	Bethlehem (Quincy)	1941	1942		3½				33		
Oakland Class	San Diego	"	"	"	"	"	Bethlehem (San Francisco)	"	"				12 5-in., many small, 40-mm., 3 aircraft.		33		
	San Juan	"	"	"	"	"	"	"	"								
	Oakland	6000	541	52½	16½	75,000	Bethlehem (San Francisco)	1942	1943								
	Reno	"	"	"	"	"	"	1944	1944								
	Flint	"	"	"	"	"	"	1944	1945								
Anti-submarine Cruisers	Tucson	"	"	"	"	"	Federal,	1945	1946				5-in. guns, 40-mm. guns.		33		
	Jensen	"	"	"	"	"	Ship Corp. Philadelphia, N.Y.			10,000,000							
	Worfolk	5500	500	50				Bldg.									
	One other							Bldg.									

* Removed from effective list.

UNITED STATES.—FLOTILLAS.

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
<i>New Construction—</i>													
Mitscher	Bath Iron-	Bldg.					2,500			5-in. guns			
John S. McCain	works	"											
Wilkinson	Bethlehem	"											
Willis A. Lee	Quincy	"											
<i>Gearing Class (Long-hull Sumners):</i>													
Gearing	Federal, Port	1945											
Eugene A. Greene	Newark	"											
Gyatt		"											
Kenneth D. Bailey		"											
William R. Rush		"											
William W. Wood		"											
Wiltzie		"											
Theo. E. Chandler		"											
Hamner		1946											
*Epperson		Bdg.											
Castle		"											
W. R. Thompson		"											
Frank Knox	Bath Iron-	1944											
Southerland	works	"											
William C. Lawe	Bethlehem,	1946											
Lloyd Thomas	San Fran-	1947											
Keppler	cisco	"											
Lansdale		Bdg.											
Seymour D. Owens		"											
Rowan	Todd, Seattle	1945											
Gurke		"											
McKean		"											
Henderson		"											
R. B. Anderson		"											
James E. Kyes		"											
Hollister		1946											
Eversole		"											
Shelton		Bdg.											
Seaman		"											
Chevalier	Bath Iron-	1945	390½	40½		2	2,400	60,000	35	6 5-in. (38 cal.) 12 or 16 40- mm. A.A.	5 or 10 21-in.	350	
Higbee	works	"											
Benner		"											
Dennis J. Buckley		"											
Corry	Consolidated	"											
New	Steel, Orange	"											
Holder	Federal	"											
Rich	Newark	"											
Johnston		Bdg.											
Robert H. McCard	"	"											
Samuel B. Roberts	"	"											
*Basilone	"	"											
*Carpenter	"	"											
*Agerholm	Bath Iron-	1946											
*Robert A. Owen	works	"											
Timmerman		Bdg.											
Myles C. Fox		1945											
Everett F. Larson		"											
Goodrich		"											
Hanson		"											
Herbert J. Thomas		"											
Turner		"											
Charles P. Cecil		"											
Geo. K. Mackenzie		"											
Sarsfield		"											
Ernest G. Small		"											
Power		"											
Glennon		"											
Noa		"											
Fiske		"											

• To be completed as Escort destroyers.

United States—DESTROYERS

Name or number	Where built	Completed	Dimensions			Number of screws	Standard displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
<i>Gearing Class—contd.</i>			Feet	Feet	Feet		Tons		Knots				Tons
Warrington		1945	390½	40½		2	2,400	60,000	35	6 5-in. (38 cal.) 12 or 16 40-mm. A.A.	5 or 10 21-in.	350	
Perry		"											
Bausell		"											
Ozbourne		1946											
Robert L. Wilson		"											
Witek		"											
Richard E. Kraus		"											
J. P. Kennedy, Jr.	Beth. Quincy	1945											
Rupertus		"											
Leonard F. Mason		1946											
Charles H. Roan		Bdg.											
Fred T. Berry	Bethlehem,	1945											
Norris	San Pedro	"											
McCaffery		"											
Harwood		"											
Vogelsgegang	Bethlehem,	1945											
Steinaker	Staten Island	"											
Harold Ellison		"											
Charles R. Ware		"											
Cone		"											
Stribling		"											
Brownson		"											
Arnold J. Isbell		"											
Fechtelers		"											
Damato		1946											
Forrest Royal		"											
Hawkins	Consolidated	1945											
Duncan	Steel, Orange	"											
Henry W. Tucker		"											
Rogers		"											
Perkins		"											
Vesole		"											
Leary		"											
Dyess		"											
Bordelon		"											
Furse		"											
Newman K. Perry		"											
Floyd B. Parks		"											
John R. Craig		"											
Orleck		"											
Brinckley Bass		"											
Stickell		"											
O'Hare		"											
Meredith		"											
<i>Sumner Class (Short Hull):</i>			376½	40½		2	2,200	60,000	35	6 5-in. (38 cal.) 12 or 16 40-mm. A.A.	5 or 10 21-in.	350	
Allen M. Sumner	Federal,	1944											
Moale	Kearny	"											
Ingraham		"											
English		"											
Chas. S. Sperry		"											
Ault		"											
Waldron		"											
Haynsworth		"											
John W. Weeks		"											
Hank		"											
Wallace L. Lind		"											
Borle		"											
Compton		"											
Gainard		"											
Soley		"											
Harland R. Dickson		1945											
Hugh Purvis		"											
Barton	Bath	1943											
Walke	Ironworks	1944											
Laffey		"											
O'Brien		"											
De Haven		"											
Mansfield		"											
Lyman K. Swenson		"											
Collett		"											
Maddox		"											
Hyman		"											
Purdy		"											
*Robert H. Smith		"											

* Completed as minelayers

United States—DESTROYERS

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
<i>Sumner Class—contd.</i>			Feet	Feet	Feet		Tons		Knots				Tons
*Thomas E. Fraser		1944	376½	40½		2	2,200	60,000	35	6 5-in. (38 cal.) 12 or 16 40-mm. A.A.	5 or 10 21-in.	350	
*Shannon		"											
*Harry F. Bauer		"											
*Adams		"											
*Tolman		"											
Blue		"											
Brush	Bethlehem, Staten Island	"											
Taussig		"											
Samuel N. Moore		"											
Harry E. Hubbard		"											
*Henry A. Wiley		"	376½	40½		2	2,400	60,000	35	6 5-in. (38 cal.) 12 or 16 40-mm. A.A.	10 21-in.	350	
*Shea		"											
A. A. Cunningham		"											
John R. Pierce		"											
Frank E. Evans		1945											
John A. Bole		"											
Beatty		"											
Putnam	Bethlehem,	1944											
Strong	San Francisco	1945											
Lofberg		"											
John W. Thomason		"											
Buck		"											
Henley		"											
Lowry	Bethlehem,	1944											
*Lindsey	San Pedro	"											
*Gwin		"	376½	40½		2	2,400	60,000	35	6 5-in. (38 cal.) 12 or 16 40-mm. A.A.	10 21-in.	350	
William Keith		"											
James C. Owens		1945											
Zellers	Todd-Pacific,	1944											
Massey	Seattle	"											
Douglas H. Fox		"											
Stormes		1945											
R. K. Huntingdon		"											
Bristol	Bethlehem,	"											
	San Pedro	"											
<i>Fletcher Class :</i>			376	39½		2	2,050	60,000	35	5 5-in. (38 cal.) 40 mm. A.A.	10 21-in.	300	
Fletcher	Federal	1942											
Radford		"											
Jenkins		"											
La Vallette		"											
Nicholas	Bath	"											
O'Bannon	Ironworks	"											
Sauley	Federal	"											
Waller		"											
Taylor	Bath	"											
Bache	Ironworks	"	376	39½		2	2,050	60,000	35	5 5-in. (38 cal.) 40 mm. A.A.	10 21-in.	300	
Beale	Bethlehem	"											
Guest	Staten Island	"											
Bennett	Boston	1943											
Fullam	Navy Yard	"											
Hudson		"											
Stanly	Charleston,	1942											
Stevens	N.Y.	1943											
Halford	Puget Sound,	"											
	N.Y.	"											
Philip	Federal	1942	376	39½		2	2,050	60,000	35	5 5-in. (38 cal.) 40 mm. A.A.	10 21-in.	300	
Renshaw		"											
Ringold		"											
Schroeder		1943											
Sigsbee		"											
Conway	Bath	1942											
Cony	Ironworks	"											
Converse		"											
Eaton		"											
Foote		"											
Terry		1943											
Anthony		"	376	39½		2	2,050	60,000	35	5 5-in. (38 cal.) 40 mm. A.A.	10 21-in.	300	
Wadsworth		"											
Walker		"											
Daly	Bethlehem,	"											
Isherwood	Staten Island	"											
Kimberley		"											
Ammen	Bethlehem,	"											
Mullany	San Francisco	"											

* Completed as minelayers.

United States—DESTROYERS

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
<i>Fletcher Class—contd.</i>			Feet	Feet	Feet		Tons		Knots				Tons
Trathen		1943											
Hazelwood		"											
Heerman		"											
McCord		"											
Miller		"											
Owen		"											
The Sullivans		"											
Stephen Potter		"											
Tingey		"											
Twining		"											
Yarnall		"											
Boyd	Bethlehem,	"											
Bradford	San Pedro	"											
Brown		"											
Cowell		"											
Capps	Gulf S.B. Co.	"											
David W. Taylor		"											
John D. Henley		1944											
Franks	Seattle-	1943											
Halley	Tacoma	"											
Laws		"											
Pritchett		1944											
Robinson		"											
Ross		"											
Rowe		"											
Smalley		"											
Stoddard		"											
Watts		"											
Wren		"											
Aulick	Consolidated	1942											
Charles Ausburn	Steel, Orange	"											
Claxton		"											
Dyson		"											
Harrison		1943											
John Rodgers		"											
McKee		"											
Murray		"											
Sproston		"	376	39½		2	2,050	60,000	35	5 5-in. (38 cal.) 40-mm. A.A.	10 21-in.	300	
Wickes		"											
Young		"											
Charette	Boston Navy	"											
Conner	Yard	"											
Hall		"											
Haraden		"											
Bell	Charleston	"											
Burns	Navy Yard	"											
Izard		"											
Paul Hamilton		"											
Howorth	Puget Sound	1944											
Killen	Navy Yard	"											
Hart		"											
Metcalfe		"											
Shields		1945											
Wiley		"											
Abbot	Bath	1943											
Braine	Ironworks	"											
Erben		"											
Hale		"											
Sigourney		"											
Stembel		"											
Albert W. Grant	Charleston,	"											
	N.Y.	"											
Caperton	Bath	"											
Cogswell	Ironworks	"											
Ingersoll		"											
Knapp		"											
Bearss	Gulf S.B. Co.	1944											
John Hood		"											
Van Valkenburgh		"											
Charles J. Badger	Bethlehem,	1943											
Colahan	Staten Island	"											
Dashiell	Federal	"											
Bullard		"											
Kidd		"											
Bennion	Boston, N.Y.	"											
Heywood L. Edwards		1944											

United States—DESTROYERS

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
<i>Fletcher Class—contd.</i>			Feet	Feet	Feet		Tons		Knots				Tons
Richard P. Leary	Charleston, N.Y.	1944	376	39½	10½	2	2,050	60,000	35	5 5-in. (38 cal.) 40-mm. A.A.	10 21-in.	800	
Bryant		1943											
Black	Federal	"											
Chauncey		"											
C. K. Bronson	Federal	"											
Cotten		1943											
Dortch	Federal	"											
Gatling		"											
Healy	Federal	"											
Hickox		"											
Hunt	Federal	"											
Lewis Hancock		"											
Marshall	Federal	"											
McDermut		"											
McGowan	Federal	"											
McNair		"											
Melvin	Federal	"											
Hopewell		"											
Porterheld	Federal	"											
Stockham		1944											
Wedderburn	Federal	"											
Picking		1943											
Halsey Powell	Federal	"											
Uhlmann		"											
Remey	Federal	"											
Wadleigh		"											
Norman Scott	Federal	"											
Mertz		"											
Cassin Young	Federal	1944											
Irwin		"											
Preston	Federal	"											
Benham		1943											
Cushing	Federal	1944											
Monssen		"											
Jarvis	Federal	"											
Porter		"											
Gregory	Federal	"											
Rooks		"											
† Selfridge Class—													
McDougall	New York	1936	381	86½	10½	2	1,850	50,000	35	5 5-in., 8 40-mm.	8 21-in. (Q)	300	
Winslow		1937											
<i>Bristol Class—</i>													
Bailey	Federal	1942	348½	36	10	2	1,630	50,000	35½	4 5-in., several 40-mm.	5 21-in.	250	
Baldwin		"											
Bancroft	Federal	1943											
Boyle		1942											
Buchanan	Federal	"											
Caldwell		"											
* Carmick	Federal	"											
Champlin		"											
Coghlan	Federal	"											
* Cowie		"											
* Davison	Federal	"											
* Doran		"											
* Doyle	Federal	"											
* Earle		"											
Edwards	Federal	"											
* Ellyson		"											
* Endicott	Federal	"											
Farenholt		"											
* Fitch	Federal	"											
Frankford		"											
Frazier	Federal	1943											
Gansevoort		1942											
* Gherardi	Federal	"											
Gillespie		"											
* Hambleton	Federal	1942											
Herndon		1941											
* Hobby	Federal	"											
* Hobson		"											
* Jeffers	Federal	"											
Kalk		"											

* Employed as minesweepers.

† For training duty only.

United States—DESTROYERS, SUBMARINES

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
<i>Bristol Class—contd.</i>			Feet	Feet	Feet		Tons		Knots				Tons
Kendrick	Bethlehem	1942	348½	36	10	2	1,630	50,000	35½	4 5-in., several 40-mm. * Ellyson class minesweepers 3 5-in., 8 40-mm.	5 21-in.	250	
* Knight	Boston	"											
Lansdowne	Federal	"											
Lardner	Federal	"											
Laub	Bethlehem	"											
* Macomb	Bath	"											
MacKenzie	Bethlehem	"											
McCalla	Federal	"											
* McCook	Seattle	"											
McLanahan	Seattle	1943											
Meade	Bethlehem	1942											
* Mervine	Federal	"											
Murphy	Bethlehem	"											
Nelson	Federal	"											
Nields	Bethlehem	1943											
Ordronaux	Bethlehem	"											
Parker	Bethlehem	1942											
* Quick	Federal	"											
* Rodman	Federal	"											
Satterlee	Seattle	1943											
Stevenson	Federal	"											
Stockton	Federal	"											
* Thompson	Seattle	"											
Thorn	Federal	"											
Tillman	Charleston	1942											
Welles	Seattle	1943											
Woodworth	Bethlehem	1942											
<i>Benson Class—</i>			348½	35½	10	2	1,630	50,000	35½	4 5-in., several 40-mm.	5 21-in.	250	
Benson	Bethlehem	1940											
Charles F. Hughes	Puget	"											
Eberle	Bath	"											
Edison	Federal	1941											
Ericson	Boston	"											
Gleaves	Bath	1940											
Grayson	Charleston	1941											
Hilary P. Jones	Charleston	1940											
Kearny	Federal	"											
Livermore	Bath	"											
Ludlow	Boston	1941											
Madison	Boston	1940											
Mayo	Bethlehem	"											
Niblack	Bath	"											
Nicholson	Charleston	1941											
Plunkett	Federal	1940											
Swanson	Charleston	1941											
Wilkes	Boston	"											
Woolsey	Bath	"											
SUBMARINES—							Surf. Sub. 2000		Surf. Sub.				
<i>Tang Class</i>	Portsmouth	Bldg.									21-in.		
Tang	N.Y.	"											
Trigger	Electric Boat	"											
Trout	"	"											
Wahoo	"	"											
† <i>Balao Class—</i>			311½	27		2	1525 2400	6,500	21	2 5-in., some smaller.	10 21-in.	60	
Balao	Portsmouth, N.Y.	1943											
Bullfish	"	"											
Bowfin	"	"											
Cabrilla	"	"											
Crevalle	"	"											
Devilfish	Cramp	1944											
Dragonet	"	"											
Hackleback	"	"											
Lancetfish	"	Bldg.											
Ling	"	1945											
Lionfish	"	1944											
Manta	"	1945											
Moray	"	"											
Roncador	"	"											
Sabalo	"	"											
Sablefish	"	"											

* Employed as minesweepers.

† Over eighty of these boats are to be fitted with "Schnorkel".

United States—SUBMARINES

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maxi-mum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons		Knots				Tons
<i>* Balao Class—contd.</i>													
Seahorse	Mare Island,	1943	311½	27		2	1525	6500	21	2 5-in., some smaller.	10	60	
Tilefish	N.Y.	"					2400				21-in.		
Aspro	Portsmouth,	"											
Batfish	N.Y.	"											
Archer Flt.	"	"											
Burrfish	"	"											
Perch	Electric Boat	1944											
Sealion	Co.	"											
Barbero	"	"											
Baya	"	"											
Becuna	"	"											
Bergall	"	"											
Besugo	"	"											
Blackfin	"	"											
Calman	"	"											
Blenny	"	"											
Blower	"	"											
Blueback	"	"											
Boarfish	"	"											
Charr	"	"											
Chub	"	"											
Brill	"	"											
Bugara	"	"											
Bumper	"	"											
Cabezon	"	"											
Captaine	"	"											
Carbonero	"	"											
Carp	"	"											
Catfish	"	"											
Entemedor	"	"											
Chivo	"	"											
Chopper	"	"											
Clamagore	"	"											
Cobbler	"	"											
Cochino	"	1945											
Corporal	"	"											
Cubera	"	"											
Cusk	"	1946											
Diodon	Cramp	"											
Dogfish	"	"											
Greenfish	"	"											
Halfbeak	"	"											
Guavina	Manitowoc	1944											
Guitarro	"	"											
Hammerhead	"	"											
Hardhead	"	"											
Hawkbill	"	"											
Icefish	"	"											
Jallao	"	"											
Kraken	"	"											
Lamprey	"	"											
Lizardfish	"	"											
Loggerhead	"	1945											
Macabi	"	"											
Mapro	"	"											
Menhaden	"	"											
Mero	"	"											
Sand Lance	Portsmouth,	1943											
Picuda	N.Y.	"											
Pampanito	"	"											
Bang	"	"											
Pintado	"	1944											
Pipefish	"	"											
Piranha	"	"											
Plaice	"	"											
Pomfret	"	"											
Sterlet	"	"											
Queensfish	"	"											
Razorback	"	"											
Redfish	"	"											
Ronquill	"	"											
Scabbardfish	"	"											
Segundo	"	"											
Sea Cat	"	"											

* Over eighty of these boats are to be fitted with "Schnorkel".

United States—SUBMARINES

Name or number	Where built	Completed	Dimensions			Number of screws	Displacement Surf./Sub.	Horse- power	Maxi- mum speed Surf. Sub.	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme) Feet	Beam Feet	Draught Feet								
<i>*Balao Class—contd.</i>													
Sea Devil	Portsmouth	1944	311½	27		2	1525 2400	6500	21	2 5-in., some smaller.	10 21-in.	60	Tons
Sea Dog	N.Y.	"											
Sea Fox	"	"											
Atule	"	"											
Spikefish	"	"											
Sea Owl	"	"											
Sea Poacher	"	"											
Sea Robin	"	"											
Sennet	"	"											
Piper (<i>ex-Awa</i>)	"	"											
Threadfin	"	"											
Spadefish	Mare Island,	"											
Trepang	N.Y.	"											
Spot	"	"											
Springer	"	"											
Stickleback	"	1945											
Tiru	"	Bldg.											
Tench	Portsmouth,	1944											
Thornback	N.Y.	"											
Tigrone	"	"											
Tirante	Cramp	"											
Trutta	Portsmouth,	"											
Toro	N.Y.	"											
Torsk	"	"											
Quillback	"	1945											
Trumpetfish	Cramp	1946											
Tusk	"	"											
Corsair	"	"											
Unicorn	"	Bldg.											
Walrus	"	"											
Argonaut	Portsmouth,	1945											
Runner	N.Y.	"											
Conger	"	"											
Cutlass	"	"											
Diablo	"	"											
Medregal	"	"											
Requin	"	"											
Irex	"	"											
Sea Leopard	"	"											
Odax	"	"											
Sirago	"	"											
Pomodone	"	"											
Remora	"	1946											
Sarda	"	"											
Spinax	"	"											
Volador	"	Bldg.											
Amberjack	Boston, N.Y.	1946											
Grampus	"	Bldg.											
Pickrel	"	"											
Grenadier	"	"											
<i>Gato Class :</i>													
Gato	Electric Boat	1942	311½	27		2	1525 2400	6500	21	2 5-in., some smaller	10 21-in.	60	
Greenling	Co.	"											
Grouper	"	"											
Guardfish	"	"											
Barb	"	"											
Blackfish	"	"											
Bluefish	"	"											
Cod	"	"											
Cero	"	"											
Drum	Portsmouth,	1941											
Flying Fish	N.Y.	"											
Finback	"	1942											
Haddock	"	"											
Kingfish	"	"											
Shad	"	"											
Silversides	Mare Island,	1941											
Whale	N.Y.	1942											
Angler	Electric Boat	1943											
Bashaw	Co.	"											
Bluegill	"	"											
Bream	"	1944											

* Over eighty of these boats are to be fitted with "Schnorkel".

United States—SUBMARINES, DESTROYER ESCORTS

Name or number	Where built	Completed	Dimensions			Number of screws	Displacement Surf./Sub.	Horse- power	Maxi- mum speed Surf. Sub.	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons		Knots				Tons
<i>Gato Class—contd.</i>													
Cavalla	Electric Boat Co.	1944	311½	27		2	1525 2400	6500	21	2 5-in., some smaller	10 21-in.	60	
Cobia	"	"											
Croaker	"	1943											
Dace	"	"											
Flasher	"	"											
Flounder	"	"											
Gabilan	"	"											
Gunnel	"	1942											
Gurnard	"	"											
Haddo	"	"											
Hake	"	"											
Hoe	"	"											
Jack	"	1943											
Lapon	"	"											
Mingo	"	"											
Muskallunge	"	"											
Paddle	"	"											
Pargo	"	"											
Peto	Manitowoc	1942											
Pogy	"	"											
Pompon	"	1943											
Puffer	"	"											
Rasher	"	"											
Raton	"	"											
Ray	"	"											
Redfin	"	"											
Rock	"	"											
Sawfish	Portsmouth,	1942											
Steelhead	N.Y.	1943											
Sunfish	Mare Island,	1942											
Tunny	N.Y.	"											
Tinosa	"	"											
DESTROYER ESCORTS													
<i>Rudderow Class :</i>													
Rudderow	Philadelphia,	1944	306	36½		2	1450	12,000	25	2 5-in. H.A./L.A. 8 40-mm., 10 20-mm.		220	
Day	N.Y.	"						T.G.					
Hodges	Charleston,	"						Some T.E.					
John C. Butler	N.Y.	"											
O'Flaherty	Consolidated	"											
Raymond	Steel, Orange,	"											
Richard W. Suesens	Texas	"											
Abercrombie	"	"											
Robert Brazier	"	"											
Edwin A. Howard	"	"											
Jesse Rutherford	"	"											
Key	"	"											
Gentry	"	"											
Traw	"	"											
Maurice J. Manuel	"	"											
Naifeh	"	"											
Doyle C. Barnes	"	"											
Kenneth M. Willett	"	"											
Jaccard	"	"											
Lloyd E. Acree	"	"											
George E. Davis	"	"											
Mack	"	"											
Woodson	"	"											
Johnnie Hutchins	"	"											
Walton	"	"											
Rolf	"	"											
Pratt	"	"											
Rombach	"	"											
McGinty	"	"											
Alvin C. Corkrell	"	"											
French	"	"											
Cecil J. Doyle	"	"											
Thaddeus Parker	"	"											
John L. Williamson	"	"											
Presley	"	"											
Williams	"	"											
Richard S. Bull	Brown-Hous-	"											
Richard M. Rowell	ton, Texas	"											
Dennis	"	"											
Edmonds	"	"											

United States—DESTROYER ESCORTS

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
<i>Rudderow Class—</i>			Feet	Feet	Feet		Tons		Knots				Tons
<i>contd.</i>													
Straus	Brown-Hous-	1944	306	36½		2	1450	12,000	25	2 5-in. H.A./		220	
La Prade	ton, Texas	"						T.G.		L.A., 8 40-			
Jack Miller	"	"						Some		mm., 10 20-			
Stafford	"	"						T.E.					
Walter C. Wann	"	"											
Le Ray Wilson	"	"											
Lawrence C. Taylor	"	"											
Melvin R. Nawman	"	"											
Oliver Mitchell	"	"											
Tabberer	"	"											
Robert F. Keller	"	"											
Leland E. Thomas	"	"											
Chester T. O'Brien	"	"											
Douglas A. Munro	"	"											
Duflho	"	"											
Haas	"	"											
Corbesier	Federal,	"											
Conklin	Newark	"											
McCoy Reynolds	"	"											
William Seiverling	"	"											
Ulvert M. Moore	"	"											
Kendall C. Campbell	"	"											
Goss	"	"											
Grady	"	"											
Charles E. Brannon	"	"											
Albert T. Harris	"	"											
Cross	"	1945											
Hanna	"	"											
Joseph E. Connolly	"	"											
Gilligan	"	"											
Formoe	Federal,	1944											
Heyliger	Newark	1945											
Edward H. Allen	Boston, N.Y.	1944											
Tweedy	"	"											
Howard F. Clark	"	"											
Silverstein	"	"											
Lewis	"	"											
Bivin	"	"											
Rizzi	"	"											
Osberg	"	"											
Wagner	"	Bldg.											
Vandivier	"	"											
Riley	Bethlehem	1944											
Leslie L. B. Knox	Hingham	"											
McNulty	"	"											
Metivier	"	"											
George A. Johnson	"	"											
Charles J. Kimmel	"	"											
Daniel A. Joy	"	"											
Lough	"	"											
Thomas F. Nickel	"	"											
Peiffer	"	"											
Tinsman	"	"											
Eugene E. Elmore	Bethlehem,	1944											
Coates	Quincy	"											
Delong	"	"											
Holt	Defoe S.B.	"											
Jobb	Co., Bay City	"											
Parle	"	"											
<i>Buckley Class :</i>													
Buckley	Bethlehem,	1943	306	37		2	1400	12,000	25	3 3-in. H.A./		220	
Fogg	Hingham	"						D.		L.A., 8 40-			
Thomas	Dravo,	"						Some		mm., 10 to 18			
Bostwick	Wilmington	"						T.E.		20-mm.			
Breeman	"	"											
Burrows	"	"											
Carter	"	"											
Clarence L. Evans	"	"											
Jacob Jones	Consolidated	"											
Hammann	Steel, Orange	"											
Robert E. Peary	"	"											
Pillsbury	"	"											
Pope	"	"											
Flaherty	"	"											
Herbert C. Jones	"	"											

United States—DESTROYER ESCORTS

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
<i>Buckley Class—contd.</i>			Feet	Feet	Feet		Tons		Knots				Tons
Douglas L. Howard	Consolidated	1943	306	37		2	1400	12,000	25	3 3-in. H.A./		220	
Farquhar	Steel, Orange							D.		L.A., 8 40-			
J. R. Y. Blakely	"	"						Some		mm., 10 to 18			
Hill	"	"						T.E.		20-mm.			
Fessenden	"	"											
Frost	"	"											
Huse	"	"											
Inch	"	"											
Blair	"	"											
Brough	"	"											
Chatelain	"	"											
Neunzer	"	"											
Poole	"	"											
Peterson	"	"											
Reuben James	Norfolk, N.Y.	"											
Levy	Federal,	"											
McConnell	Newark	"											
Osterhaus	"	"											
Parks	"	"											
Baron	"	"											
Agree	"	"											
Amick	"	"											
Atherton	"	"											
Booth	"	"											
Carroll	"	"											
Cooner	"	"											
Eldridge	"	"											
Micka	"	"											
Trumpeter	"	"											
Straub	"	"											
Gustafson	"	"											
Samuel S. Miles	"	"											
Wesson	"	"											
Riddle	"	"											
Swearer	"	"											
Stern	"	"											
O'Neill	"	"											
Bronstein	"	"											
Baker	"	"											
Coffman	"	"											
Eisner	"	"											
Garfield Thomas	"	1944											
Wingfield	"	"											
Thornhill	"	"											
Roche	"	"											
Lovelace	Norfolk, N.Y.	1943											
Manning	Charleston,	"											
Neuendorf	N.Y.	"											
James E. Craig	"	"											
Elchenberger	"	"											
Thomason	"	"											
Otter	"	1944											
William T. Powell	"	"											
Coolbaugh	Philadelphia,	1943											
Darby	N.Y.	"											
J. Douglas	"	"											
Blackwood	"	"											
Francis M. Robinson	"	1944											
Fowler	"	"											
Spangenberg	"	"											
Stewart	Brown S.B.	1943											
Sturtevant	Co., Houston	"											
Moore	"	"											
Keith	"	"											
Tomlich	"	"											
J. Richard Ward	"	"											
Otterstetter	"	"											
Sloat	"	"											
Snowden	"	"											
Stanton	"	"											
Swasey	"	"											
Marchand	"	"											
Hurst	"	"											
Camp	"	"											
Howard D. Crow	"	"											
Pettit	"	"											
Ricketts	"	"											

United States—DESTROYER ESCORTS

Name or Number	Where built	Com- pleted	Dimensions			Number of screws	Standard displacement	Horse- power	Maxi- mum speed	Armaments	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
<i>Buckley Class—contd.</i>													
Sellstrom	Brown S.B.	1943	Ft. 306	Ft. 37	Ft.	2	Tons 1400	12,000	Knots 25	3 3-in. H.A./ L.A., 8 40- mm., 10 to 18 20-mm.		220	
Harveson	Co., Houston	"						D. Some					
Joyce	Consolidated,	"						T.E.					
Kirkpatrick	Orange	"											
Menges	"	"											
Mosley	"	"											
Newell	"	"											
Pride	"	"											
Falgout	"	"											
Lowe	"	"											
Thomas J. Gary	"	"											
Brister	"	"											
Finch	"	"											
Kretchner	"	"											
O'Reilly	"	"											
Kolner	"	"											
Price	"	1944											
Strickland	"	"											
Forster	"	"											
Daniel	"	"											
Roy O. Hale	"	"											
Dale W. Peterson	"	"											
Martin H. Ray	"	"											
Ramsden	Brown S.B.	1943											
Mills	Co., Houston	"											
Rhodes	"	"											
Richey	"	"											
Savage	"	"											
Vance	"	"											
Lansing	"	"											
Durant	"	"											
Calcaterra	"	"											
Chambers	"	"											
Merrill	"	"											
Haverfield	"	"											
Swenning	"	"											
Willis	"	"											
Janssen	"	"											
Wilhoite	"	"											
Cockrill	"	"											
Stockdale	"	"											
Hissen	"	"											
Ahrens	Bethlehem,	1944											
Alexander J. Luke	Hingham	"											
Robert I. Paine	"	"											
Foreman	Bethlehem,	1943											
Whitehurst	San Francisco	"											
Witter	"	"											
Willmarth	"	"											
Gendreau	"	"											
Fieberling	"	1944											
William C. Cole	"	"											
Paul G. Baker	"	"											
Damon M.	"	"											
Cummings	"	"											
Vammen	"	"											
Wiseman	Dravo,	1944											
	Wilmington	"											
Harmon	Bethlehem,	1943											
Greenwood	Quincy	"											
Loeser	"	"											
Gillette	"	"											
Henry R. Kenyon	"	"											
Spangler	Defoe S.B.	1943											
George	Co., Bay City	"											
Raby	"	"											
Marsh	"	"											
Currier	"	"											
Osmus	"	"											
Earl V. Johnson	"	1944											
Holton	"	"											
Cronin	"	"											
Frybarger	"	"											
Bangust	Western, San	1943											
Waterman	Pedro	"											
Weaver	"	"											
Hilbert	"	"											

United States—DESTROYER ESCORTS, ETC.

Name or class name and number of vessels in commission	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse- power	Maxi- mum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
<i>Buckley Class—contd.</i>			Feet	Feet	Feet		Tons		Knots				Tons
Kyne	Western, San	1944	306	37		2	1400	12,000	25	3 3-in. H.A./		220	
Snyder	Pedro	"						D.		L.A., 8 40-			
Hemminger	"	"						Some		mm., 10 to 18			
Bright	"	"						T.E.		20-mm.			
Tills	"	"											
Roberts	"	"											
McClelland	"	"											
Cates	Tampa,	1943											
Gandy	Florida	1944											
Earl K. Olsen	"	"											
Slater	"	"											
Oswald	"	"											
Ebert	"	"											
Neal A. Scott	"	"											
Muir	"	"											
Sutton	"	"											
Gunason	Consolidated	1944											
Major	Steel, Orange	"											
Weeden	"	"											
Varian	"	"											
Scroggins	"	"											
Jack W. Wilke	"	"											
*MOTOR TORPEDO BOATS—													
Vosper Type (138)		1942	70	19		3	43	4,050	40	2 21-in. (in tubes)		2	
Elco " (358)		"	80½	20½		3	45	4,050	40	4 21-in. (in racks)		14	
Huckins " (18)		"	78	19½	6	3	48	4,050	40	4 21-in. (in tubes)		12	
Higgins " (224)		"	78	20	6	3	46	4,050	40	4 21-in. (in racks)		12	
Trumpy " (24)		1944	63	15½	4	2	24	1,260	28	No torpedoes		10	
Elco " (49)		1941	77	20	5½	3	45	4,050	40	2 2-in.		12	
MINELAYERS—													
Terror	Philadelphia	1942	453½	60½		2	5875	11,000 (G.)		4 5-in.		400	
Chimo	Marietta, San	1943	188	37		1	700	600	10			100	
Planter	Francisco	"	"	"		"	"	"	"			"	
Robert E. Smith Class—a number of <i>ex</i> -destroyers (see destroyer tables).													
MINESWEEPERS—													
Auk Class (63)		1940– 1945	220½	32		2	890	3,500 (Dies. elect.)	18	1 3-in.		100	
Admirable Class (55)		1942– 1945	184½	33		2	795	1,800 (Dies. elect.)	15	1 3-in.		100	
†Ellyson Class (20)		1941– 1942	348	36		2	1630	50,000	35	3 5-in., 8 40- mm.			
Motor Minesweepers (approx. 50)		1941–	136	24½		2	210	1,000 (D.)	12	1 3-in.		50	
SUBMARINE CHASERS—													
PCE Type (34)		1943	184½	33			795	2,400 (D.)	20	2 3-in.		110	
PC Type (143)		"	173½	23			280	3,600 (D.)	20	1 or 2 3-in.		80	
PCS Type (18)		"	136	23½			267	1,000 (D.)	14½	2 3-in.		40	

* U.S. Navy is to dispose of all its M.T.Bs., etc.

† *ex*-destroyers.

SEAPLANE TENDERS.—Cumberland Sound, St. George, Hamlin, Kenneth Whiting, Albermarle, Curtiss, Currituck, Norton Sound, Pine Island, Salisbury Sound, 9,000 tons, 18 knots, 4 5-in., 24 seaplanes; Greenwich Bay, Floyds Bay, Gardiners Bay, Rockaway, Humboldt, Matagorda, Valcour, Timballer, Duxbury Bay, Corson, Cook Inlet, Castle Rock, Suisun, Barataria, Bering Strait, Rehoboth, Orca, Uniamk, Onalow, Halfmoon, Coos Bay, Chincoteague, Shellikof, Yakutat, San Carlos, San Pablo, Absecon, Mackinac, Casco, Barnegat, 1,650 tons, 20 knots, 1 5-in. gun; several *ex*-merchant ships.

DESTROYER TENDERS.—Hamul, Everglades, Frontier, Yellowstone, Klondike, Shenandoah, Arcadia (1945), 8,180 tons, 492 ft., 16½ knots; Dixie, Prairie, Piedmont, Sierra, Yosemite, Grand Canyon, Isle Royal, Tidewater, Bryce Canyon (1942–45) 9,450 tons, 530 ft., 18 knots; Cascade, Markab, 10,000 tons, 492 ft., 16½ knots.

United States—MISCELLANEOUS CRAFT

SUBMARINE TENDERS.—Fulton, Sperry, Bushnell, Howard W. Gilmore, Nereus, Orion, Proteus (1937), 9,250 tons, 529½ ft. 18 knots; Euryale (1941), 10,700 tons, 492½ ft., 16½ knots; Clytie, Aegir, Apollo, Anthedon (1945), 8,200 tons, 492 ft., 16 knots, 1 5-in.; Pallas Griffin (1940), 6,400 tons, 16½ knots, 4 3-in. For rescue duties—Chanticleer, Coucal, Florikan, Greenlet, Kittiwake, Petrel (1940), 1,780 tons, 251½ ft., 16½ knots.

OCEAN TUGS.—77 in number—600 tons, 143 ft., 1,500 H.P. (D.), 12½ knots; 65 in number—1,280 tons, 205 ft., 3,000 H.P. (D. elect.), 16 knots.

SURVEYING SHIPS.—Pathfinder, Hydrographer, Oceanographer, Bowditch, Sumner, Dericsson.

AMMUNITION SHIPS.—Pyro, Nitro, Lassen, Mount Baker, Rainier, Shasta, Mauna Loa, Mazama, Sangay, Wrangell, Akutan, Firedrake, Vesuvius, Mount Katmai, Great Sitkin, Paracutin, Diamondhead.

REPAIR SHIPS.—Vulcan, Ajax, Hector, Delta, Briareus, Amphion, Cadmus, Xanthus, Laertes, Dionysus.

REPAIR SHIPS (Battle Damage).—Aristæus, Oceanus, Phaon, Zeus, Midas, Sarpedon, Telamon, Ulysses, Demeter, Diomedes, Hellos (*ex-LST's*).

REPAIR SHIPS (I.C. Engines).—Oglala, Luzon, Mindanao, Tutville, Oahu, Cebu, Culebra Island, Maui, Mona Island, Palawan, Samar, Kermat, Roosevelt, Hooper Island, 1 5-in., 3 3-in., 10,000 tons; Holland, 8,100 tons, 16 knots.

REPAIR SHIP (Heavy Hull).—Jason, 9,100 tons, 530 ft., 19 knots, 4 5-in.

REPAIR SHIPS (Landing Craft).—Achelus, Amycus, Agenor, Adonis, Atlas, Egeria, Endymion, Coronis, Creon, Poseidon, Menelaus, Minos, Minotaur, Stentor, Typhon, Amphitrite, Askari, Bellerophon, Chimaera, Daedalus, Gordius, Indra Kriskna, Quirinus, Proserpine, Sphinx, Satyr, Patroclus, Numitor, Myrmidon, Pentheus, Pandemus, Romulus.

REPAIR SHIPS (Aircraft).—Chourre, Webster, 10,000 tons, 11 knots. Aventinus, Chloris, Fabius, Megara (*ex-LST's*).

SALVAGE VESSELS.—Viking, Crusader, Discoverer, Diver, Escape, Grapple, Preserver, Shackle, Warbler, Willet, Anchor, Protector, Extricate, Restorer, Cable, Chain, Curb, Current, Deliver, Grasp, Safeguard, Seize, Snatch, Valve, Vent, Accelerate, Harjurand, Brant, Clamp, Gear, Weight, Swivel, Tackle, Bolster, Conserver, Hoist, Opportune, Reclaimer, Recovery.

OLLERS.—Cohocton, Tamalpais, Caney, Anacostia, Soubarissen, Tomahawk, Sebee, Ponganset, Pomanset, Ocklawaha, Mascoma, Canaba, Kennebago, Escambia, Alagash, Tolovana, Chipola, Taluga, Severn, Nantahala, Manatee, Marias, Aucilla, Elokimin, Chikaskia, Caliente, Cacapon, Ashtabula, Cimarron, Platte, Brazos, Ramapo, Sapelo, Trinity, Sepulga, Salinas, Tippecanoe, Rapidan, Cuyama, Mattole, Kaweah, Laramie, Sabine, Chemung, Guadalupe, Salamonie, Kaskasia, Chicopee, Housatonic, Kennebee, Merrimack, Winooksi, Kankakee, Lackawana, Mattaponi, Monongahela, Tappahannock, Patuxent, Victoria, Neches, Neosho, Suamico, Cache, Tallulah, Pecos, Atascosa, Chiwawa, Enoree, Saranac, Saugatock, Escalante, Neshanic, Niobrara, Millicoma, Schuylkill, Cossatot, Chepachet, Cowanesque.

GASOLINE TANKERS.—Nespelem, Natchaug, Namakagon, Mattabesset, Mogoketa, Chewaucan, Chestatee, Chehalis, Tombigee, Nemasket, Kishwaukee, Genesee, Elkhorn, Agawam, Susquehanna, Wabash, Rio Grande, Kern, Patapsco, Halawa, Kaloli, Mettawee, Pasquotank, Sakatonchee, Seekonk, Sequatchie, Wautauga, Ammonusuc, Calamus, Chiwankum, Escatawpa, Gualala, Hiwassee, Kalamazoo, Kanawha, Ocklockonee, Oconee, Narraguagas, Ogeechee, Ontonagon, Yahara, Ponchatoula, Quastinet, Sacandaga, Tetonkaha, Towaliga, Tularosa, Wakulla, Yacona, Waupaca, Manokin, Sakonnet, Conemaugh, Klaskanine, Shikellamy, Nanticoke, Michigamme, Klickitat.

HOSPITAL SHIPS.—Relief, Solace, Comfort, Hope, Merry, Bountiful, Samaritan, Refuge, Haven, Benevolence, Tranquillity, Consolation, Repose, Sanctuary, Rescue.

TRANSPORTS.—Lejeune (1936), 19,200 tons, 18 knots, 1 5-in., 3 3-in.; Wakefield (1932), 22,800 tons, 21½ knots; General Anderson, General Mann, General Butner, General Mitchell, General Randall, General Breckenridge, 20,000 tons, 21 knots, 4 5-in.

ATTACK TRANSPORTS.—Bayfield, Cambria, Cavalier Chilton, Fremont, Henrico (1942), 16,100 tons, 2 5-in. Very many others.

SHIPS OF THE LESSER NAVIES

BELGIUM

FRIGATE. **Luitenant Ter See Victor Billet** (ex-U.S.S. Sheboygan), 1,430 tons, 19 knots, 1 3-in.

SLOOP. **Jan Breydel** (1920), 1,300 tons, 14 knots, 1 4·1-in., 14 20-mm.; **Artevelde** (1940), 1,600 tons, 26·5 knots, 3 4·1-in., 2 40-mm.

SAILING TRAINING SHIP. **Mercator**.

MOTOR MINESWEEPERS (ex-R.N.). 8 in number, 255 tons, 10 knots.

DEPOT SHIP. **Prinses Marie Jose**, 2,500 tons.

BOOM DEFENCE VESSEL. **Barcock** (1941), 730 tons, 11·5 knots.

BULGARIA *

MOTOR TORPEDO BOATS. 3 in number (Lurssen, 1939), and 2 in number (Varna, 1942), 60 tons, 30 knots, 1 M.A.A., 2 21-in. torpedo tubes.

PATROL VESSELS. **Rila**, and one other (1941), 200 tons, **Smyeli**, **Derkzi**, **Khrabri**, **Strogi** (ex-French, 1907-08), 97 tons, 17 knots, 2 1·85-in., 1 M., 2 18-in. torpedo tubes.

MINESWEEPERS. 2 in number (ex-French, 1918), 350 tons, 17 knots; 19 others of 18 tons.

TRAINING SHIPS. **Tsar Assen** (ex-Dutch, 1912), 240 tons, 9 knots, 2 2·6-in., 1 M.; **Kamcia** (1898), 10 knots.

MOTOR BOATS. **Vzrif** and **Captain Minkoff** (ex-French, 1918), 40 tons, 14 knots, 2 M.; **Belmoretz** and **Chernomoretz** (ex-French, 1918), 77 tons, 17 knots, 1 1·85-in., 2 M.

CHINA

LIGHT CRUISER. **Kung Wei** (ex-H.M.S. Aurora), 5,270 tons, 506 ft., 32 knots, 6 6-in. guns, 8 4-in.

DESTROYERS. Ex-Japanese **Hatsume** (1944), 2,100 tons, 6 4·7-in.; **Kaedi**, **Suge** (1944), 1,000 tons, 3 5-in.; **Yoitsuki** (1941), 2,300 tons, 8 4-in.; **Yukikaze** (1939), 2,000 tons, 6 5-in.; **Namikaze** (1922), 1,215 tons, 4 4·7-in.; **Tsuta** (1920), 770 tons, 3 4·7-in.

ESCORT VESSELS. **Yat Sen** (1930), 1,600 tons, 16 knots, 1 6-in., 1 5·5-in., 4 3-in., **Tai Ping** (1943), ex-U.S.S. D.E. 47; **Tai Kang** (1943), ex-U.S.S. D.E. 6, 3 3-in., 4 40-mm., 11 20-mm.

SLOOP. **Chang Chi**, 1,350 tons, 3 5-in.; **Oki**, **Tsushima**, **Yashiro**, 1200 tons, 3 4·7 in.; **Yat Sen**, 1,650 tons, 1 4·7-in.

GUNBOATS. **Antung**, **Cho Kuan**, **Chu Tong**, **Chu Chien**, 740 tons.

RIVER GUNBOATS. **Fa Ku** (ex-French), **Ying Ho** (ex-H.M.S. Sandpiper), 185 tons, 11¼ knots, 1 3·7-in. howitzer, 1 6-pdr.; **Ying Teh** (ex-H.M.S.

* Bulgaria has handed her navy over to the Soviet Union.

Falcon), 372 tons, 15 knots, 1 3·7-in. howitzer, 2 6-pdr.; **Ying Shan** (ex-H.M.S. Gannet), 310 tons, 16 knots, 2 3-in. H.A.; **Yung Ping** (ex-Japanese), 170 tons; **Yung An** (ex-Japanese), 170 tons; **Chang Teh** (ex-Japanese), 300 tons.

MINESWEEPERS. 900 tons, **Yung Sheng, Yung Shun, Yung Ting, Yung Ning** (ex-U.S.S. Lance, Logic, Lucid, Magnet).

PATROL VESSELS. 2 in number, ex-U.S.S. P.C.E. 867, 869; 800 tons disp. L.S.T., ex-U.S.N., 9 in number, 1,625 tons; L.S.M., ex-U.S.N., 7 in number, 520 tons; L.S.I., ex-U.S.N., 7 in number, 380 tons; L.C.T., ex-U.S.N., 3 in number, 280 tons.

TRANSPORTS. Ex-U.S.S. Maumee, 14,000 tons, and several others.

COLOMBIA

DESTROYERS. **Caldas and Antioquia** (Yarrow, 1934), 1,282 tons, 319 ft. B.P., 31 ft. beam, 36 knots, 4 4·7-in., 3 1·5-in. A.A., 2 depth charge throwers, 8 21-in. torpedo tubes, 296 tons of oil fuel, 140 complement. Fitted for minelaying.

GUNBOATS. **Mariscal Sucre** (Yarrow, 1909), 125 tons, 23 knots, 2 3-in., 3 m.; **Pichincha, Carabobo, and Junin** (ex-French, 1925), 200 tons, 13 knots, 1 3-in., 2 m.; **Barranquilla, Cartagena, and Santa Marta** (Yarrow, 1930), 140 tons, 13·5 knots, 2 3-in., 8 m.

RIVER GUNBOAT. **Presidente Mosquera**, 200 tons, 2 1·5-in.

TRANSPORT. **Fernandez Madrid**, 150 tons, 15 knots, 2 20-mm.; **Cutuca**, 12,000 tons, 10 knots.

TRAINING SHIP. **Cucuta** (ex-U.S.A., 1913), 5,278 tons gross, 10 knots.

SUBMARINE-CHASERS. **O 21, O 22** (ex-U.S.N.), 45 tons, 23 knots, 1 20-mm.

OILER. **Cabimas** (1924), 3,600 tons, 16 knots.

TUGS. **Andagoya, Abadia Mendez.**

COSTA RICA

Coastal craft only.

CUBA

LIGHT CRUISER. **Cuba** (Cramp, Philadelphia, 1911), 2,055 tons, 18 knots, 6,000 H.P., 2 4-in., 6 3-in. H.A., 4 6-pdr., 4 3-pdr., 2 m., 250 tons of coal.

FRIGATES. **Antonio Maceo, Jose Marti, Maximo Gomez** (ex-U.S.N. P.F.s, 1943), 1,400 tons, 19 knots.

ESCORT VESSELS. **Caribe, Siboney** (ex-U.S.N. P.C.E.'s), 600 tons, 15 knots, 1 3-in., 6 40-mm.

GUNBOATS. **General Zagas**, 500 tons, 2 1-pdr.; **Capitan Fernandez Quevedo** (Havana, 1932), 115 tons, 12 knots, 1 3-in. H.A., 2 1-pdr.; **Habana, Pinar del Rio, Villas, and Matanzas** (Havana, 1912), 80 tons, 12 knots, 1 1-pdr.; **24 de Febrero** and **10 de Octubre** (J. S. White, 1911), 218 tons, 12 knots, 3 3-pdr.; **Baire** (Danzig, 1906), 500 tons, 14 knots, 4 3-in., 2 3-pdr., 1 m.; **Yara** (Middlesbrough,

1905), 450 tons, 12 knots, 1 3-in. H.A., 2 6-pdr.; **20 de Mayo** (Glasgow), 1895), 200 tons, 12 knots, 2 3-pdr., 1 1-pdr.; **Enrique Villuendus** (ex-U.S.A., 1899), 178 tons, 16 knots, 2 3-pdr.; **Donativo** (1930), 130 tons; **Camaguey** (1922), 113 tons; **Oriente**, 110 tons; **Cuatro de Septiembre** (1942), 85 tons; **Santa Clara**.

TRAINING SHIP. **Patria** (Cramp, Philadelphia, 1911), 1,200 tons, 16 knots, 2 3-in., 4 6-pdr., 4 3-pdr.

TRANSPORTS. **Carcorbe** (1907), 3,335 tons; **Colombia**, 1,119 tons.

SUBMARINE CHASERS. 12 in number (ex-U.S. C.G. Cutters), **C.S. 11-14, 21-24, 31-34** (1941-44), 100 tons, 23 knots. 5 in number (ex-U.S. S.C.'s).

TUGS. 2 in number (ex-U.S. A.T.R.'s 3, 54).

DOMINICAN REPUBLIC

DESTROYERS. **Trujillo** (ex-R.N. Hotspur), **Generalissimo** (ex-R.N. Fame), 1,350 tons, 36 knots, 3 4·7-in., 8 21-in. torpedo tubes.

FRIGATE. **Presidente Trujillo** (ex-H.M.C.S. Carlplace (River Class)), 1,445 tons, 20 knots.

CORVETTES. **Colon, Jean B, Cambiaso, J. Jansen, Juan B. Maggioli** (ex-R.C.N. Flower Class, 1944), 1,000 tons, 16·5 knots.

PATROL VESSELS. **C.G. 9, 10, 11** (ex-U.S.N., 1943), 45 tons, 13½ knots.

ECUADOR

FRIGATE. **Guayas** (ex-U.S. P.F. 56), 1,430 tons, 20 knots, 2 3-in., 2 40-mm., 4 20-mm.

PATROL VESSELS. **Neuve de Octubre** (ex-U.S.S. P.Y.18), 1940, 565 tons, 1 3-in., 2 20-mm.; **Cinco de Junio** (ex-U.S.S. A.P.C.85), 1943, 234 tons, 4 20-mm.; **Diez de Agosto** (ex-U.S.S. P.Y.8), 1941, 590 tons, 2 3-in.; **Atahualpa** (Guayaquil N.Y.), 1927, 100 tons (lighthouse tender).

TRAINING SHIP. **Presidente Alfaro** (Southampton, 1917), 1,030 tons, 16 knots, 2 3-in.

GUNBOAT. **Abdon Calderon** (ex-Cotopaxi) (1884), 300 tons, 10·5 knots.

EGYPT

PATROL VESSELS. **Raqib** (Alexandria, 1938), 15 knots, 1 1·46-in.; **Al Sarea** (J. S. White, 1937), 13 tons, 36 knots, 1 1·46-in.; **El Amira Fawzia** (Swan Hunter, 1929), 2,640 tons, 14 knots, 2 3-pdr.; **El Amir Farouq** (Hawthorn Leslie, 1926), 1,441 tons, 17 knots, 1 6-pdr., 2 M.; **Mabahiss** (Swan Hunter, 1930), 618 tons, 11 knots, 1 3-pdr.

TRAINING SHIP. **Abdel Monaym** (Clydebank, 1902), 610 tons, 13·5 knots.

INSPECTION VESSEL AND STORE CARRIER. **Naphtys** (Kiel, 1905), 650 tons, 7·5 knots.

ROYAL YACHT. **Mahroussa** (Poplar, 1865), 4,561 tons, 16 knots.

COASTAL MOTOR BOATS. **Darfeel** and **Noor El Bahr** (Thornycroft, 1926), 20 tons, 17 knots, 1 1·46-in.; **Qamar**, 23 tons, 11 knots; **El Hoot**, 24 tons, 7 knots.

MOTOR MINESWEEPERS. (Ex-U.S., built B.Y.M.S.), 9 in number, 290 tons, 14½ knots.

L.S.T. **Aka**, 2,140 tons.

EIRE

MOTOR TORPEDO BOATS. **M1-M6**, 32 tons, 40 knots, 2 21-in. torpedo tubes.

CORVETTES. (Flower Class, ex-R.N.), **Macha**, **Maev**, **Cliona**, 1,060 tons, 16·5 knots, 1 4-in., 4 20-mm.

PATROL BOAT. **Fort Rannock**.

ESTONIA

(See under Soviet Union.)

FINLAND

GUNBOATS. **Turunmaa** (ex-Russian Orlan, 1918), **Karjala**, 342 tons, 14 knots, 2 3-in., 5 6-pdr.; **Uusimaa** (ex-German Beo) and **Hämeenmaa** (ex-German Wulf, 1918), 400 tons, 15 knots, 2 4-in., 1 1·5-in. A.A.

MOTOR TORPEDO BOATS. **Syöksy**, **Nuoli**, **Vinha**, and **Raju** (1929), 13 tons, 35 knots, 2 M., 2 18-in. torpedo tubes; **J.1**, **J.2**, **J.3**, **J.4** (ex-Italian), 1942, 21 tons, 60 ft., 50 knots, 2 18-in. torpedoes, 1 M. Eight others (Helsinki) and two more building.

SUBMARINES. Now incorporated in U.S.S.R. Baltic Fleet.

MINELAYERS. **Pommi**, **Paukku**, **Lieska**, **Miina**, **Loimu** (1916), 80 tons, 8 knots, 2 M., 24 mines; **Ruotsiinsalmi** (1940), 300 tons, 1 3-in., 1 40-mm., 2 20-mm. (now used for minesweeping).

MINESWEEPERS. **Ahven**, **Kiiski**, **Muikku**, and **Sarki** (1937), 17 tons, 10 knots. Building; 2 Kuha type, 2 Kallanpla type.

MOTOR LAUNCHES. **Haukka**, **B.V.A.**, and **B.V.D.** (1934), 9-25 tons, 8-10 knots, 1 M.

PATROL BOATS. **V.M.V. 1**, **2**, **5**, **6** (1931), **V.M.V. 8-17** (Germany, 1935), 30 tons, 25 knots, 1 7·75-in. (**V.M.V. 10** and **14** reported sunk.)

SUPPLY SHIPS. **Dobeln**, 750 tons, 9 knots; **Rautu**, 265 tons, 12 knots.

TRAINING SHIP. **Suomen Joutsen** (St. Nazaire, 1902), 3,000 tons, 6 knots.

ICEBREAKERS. **Otso** (1936), 800 tons, 13 knots; **Sampo** (Armstrong, 1899), 1,850 tons, 15 knots, 3 4·7-in.; **Tarmo** (ex-Sampo II) (Armstrong, 1907), 2,400 tons, 14 knots; 3 4·7-in.; **Murtaja** (Stockholm, 1890), 820 tons, 11 knots, 1 4·7-in.; **Apu** (Kiel, 1899), 600 tons, 13 knots, 2 4·7-in.

HAYTI

SPECIAL SERVICE VESSEL. **Savannah** (ex-U.S. C.G. Cutter), 53 tons, 20 knots, 1 20-mm.

HONDURAS

FRIGATE. — (ex-H.M.C.S. Thetford Mines), 1,445 tons, 20 knots, 2 4-in., 10 20-mm.

HUNGARY

PATROL VESSELS. **Debreczen**, **Gyor**, **Baja**, and **Sopron** (Budapest, 1918), 140 tons, 15 knots, 2 2.75-in., 2 m.; **Kecskemet** and **Szeged** (Budapest, 1915), 133 tons, 15 knots, 4 2.75-in., 2 m.

AUXILIARY VESSELS. **Csobánc** (1926), 300 tons, 8 knots; **Körös** (1916), 170 tons; **Maros** (1927), 40 tons; **Mecsek**, 35 tons.

MOTOR BOATS. **Honved**, **Huszar**, and **Tuzer** (1916), 17 tons, 7 knots, 2 m.; 2 in number, 30 tons; 10 in number, 10 tons.

TRAINING SHIP. **Badacsony** (1909), 230 tons, 10.5 knots.

ICELAND

FISHERY PROTECTION VESSELS. **Aegir** (1925), 500 tons, 14 knots, 1 2.24-in.; **Thor** (ex-German, 1922), 300 tons, 10 knots, 1 2.24-in.; **Odinn** (1938), 72 tons, 11 knots, 1 1.85-in.; **Esja**, 1,347 tons (gross); **Finnbjorn**.

LIGHTHOUSE TENDER. **Hermodur**.

IRAQ

PATROL VESSELS. **Nos. 1, 2, 3, 4** (Thornycroft, 1937), 100 ft. length, 64 tons, 12 knots, 1 3.7-in. howitzer, 4 m.

YACHT. **Panfilo X** (ex-Sans Peur, J. Brown, 1923), 1,200 tons, 13 knots.

TUG. **Alarm**, 820 tons, 12 knots.

LATVIA

(See under Soviet Union.)

LITHUANIA

(See under Soviet Union.)

MANCHUKUO

(Before occupation by the Soviet Union.)

DESTROYER. **Hai Wei** (ex-Japanese Kashi, Maizura, 1917), 755 tons, 31.5 knots, 3 4.7-in., 3 m., 6 18-in. torpedo tubes.

GUNBOATS. **Chingjen** and **Tingpjen** (Harima, 1935), 290 tons, 13 knots, 2 4.7-in., 3 m.; **Shun T'ien** and **Yang Min** (Harima, 1934), 270 tons, 12 knots, 2 4.7-in. A.A., 3 m.; **Li Sui** (ex-German, 1910), 270 tons, 13 knots, 2 2.24-in., 2 m.; **Li Chi** (ex-German, 1904), 270 tons, 13 knots, 1 3-in., 4 m.; **Kuang Ning**, **Kuang Ch'ing**, and **Chiang T'ung** (1900), 200 tons, 9 knots, 1 3-in., 4 m.; **Ta T'ung** and **Li Min** (Kobe, 1933), 65 tons, 10.5 knots, 3 m.

ARMED LAUNCHES. **Chi Min** (Kawasaki, 1934), 20 tons, 10 knots, 2 m.; **En Min, Hui Min, P'u, Min** (Kawasaki, 1933), 15 tons, 10 knots, 2 m.

PATROL BOATS. **Hailung** and **Haifeng** (Kawasaki, 1933), 184 tons, 14 knots, 2 3·1-in., 2 m.; **Hai Kuang, Hai Jui, Hai Jung, Hai Hua** (Kawasaki, 1933), 42 tons, 12 knots, 1 2·24-in., 2 m.; **Daichi Kaihen** and **Daini Kaihen** (Yokohama, 1933), 42 tons, 15 knots, 2 m.

MEXICO

SLOOPS. **Durango** (Valencia, 1936), 1,600 tons, 20 knots, 4 4-in., 2 twin 1-in. pom poms, 2 quadruple ·5-in. m., can carry 500 men and 80 horses; **Potosi** (Cadiz, 1935), **Queretaro** and **Guanajuato** (Ferrol, 1935), 1,200 tons, 20 knots, 3 4-in., 2 twin 1-in. pom poms, 2 quadruple ·5-in. m. A.A., can carry 250 men and 20 horses.

FRIGATES. (Ex-U.S.N. P.F.'s), **General Hermenegildo Galeano, General Jose Maria Morelos, General Nicolas Bravo, General Vicente Guerrero**, 1,430 tons, 19 knots, 1 3-in., 4 40-mm.

PATROL ESCORT VESSELS. (Ex-U.S.N. P.C.E.'s), **Pedro Sainz de Baranda, Blas Godinez, Tomas Marin, David Porter, Virgilio Uribe**, 600 tons, 18 knots, 1 3-in., 6 40-mm.

GUNBOATS. **G. Nos. 20-27, 29** (Bilbao, 1935), 130 tons, 26 knots, 1 twin ·5 pom pom, 1 quadruple 1-in. pom pom.

TRANSPORTS. **Progreso** (Genoa, 1907), 1,590 tons, 13 knots, 4 6-pdr., 2 m.; **Orizaba** (ex-Southern Cross, Glasgow, 1930), 1,851 tons, 11 knots.

OIL TANKER. **Mexico** (1913), 2,559 tons (gross).

PATROL BOATS. **Mazatlan, Acapulco, and Vera Cruz** (Canada, 1918), 486 tons, 8 knots, 1 2·2-in., 2 1·5-in., 2 m.; **Halcon, Nereida**, 83 tons, 20 knots.

SUBMARINE CHASERS. 3 in number (ex-U.S.A.), **C.S. 11, 12, 13**, 99 tons, 1 40-mm.

TUGS. **Rio Blanco**, 100 tons, 9 knots; **Gorumel, Guerrero**, 750 tons.

NICARAGUA

PATROL BOATS. 1 in number (ex-U.S.A., CG274) (1924), 37 tons, 75 ft., 13·5 knots, 1 1-pdr.; **GN 1, 2, 3** (75 ft. long).

PARAGUAY

GUNBOATS. **Paraguay** and **Humaita** (Genoa, 1931), 636 tons, 17 knots, 4 4·7-in., 4 3-in. H.A., 2 m.; **Capitan Cabral** (England, 1910), 120 tons, 10 knots, 1 3-in., 2 6-pdr., 2 m.

DESPATCH VESSEL. **Teniente Herreros** (Conrad, 1908), 100 tons, 12 knots, 1 3-in., 2 1-pdr., 2 m.

PATROL VESSELS. 6 in number, 45 tons, 20 knots, ex-U.S. C.G. Cutters, transferred 1944.

PERSIA (IRAN)

PATROL VESSELS. **Simorgh**, **Chahbaaz**, and **Chahrokh** (Naples, 1932), 325 tons, 15 knots, 900 B.H.P., 2 3-in., 2 m.

MOTOR BOATS. **Azerbaijan**, **Gehlani**, and **Mazenderan** (Palermo, 1935), 68½ ft., 28 tons, 14 knots, 1 1·5-in.

TUG. **Niru** (1935), 14 knots.

ROYAL YACHT. **Chasevar**, 530 tons, 15 knots.

PERU

LIGHT CRUISERS. **Almirante Grau** and **Coronel Bolognesi** (Vickers, 1907), 3,200 tons, 24 knots, 2 6-in., 8 3-in., 8 m., 2 18-in. torpedo tubes.

DESTROYERS. **Almirante Guise** (ex-Russian, 1917), 1,400 tons, 35 knots, 5 3-in., 1 2-pdr. A.A., 1 m., 3 18-in. triple torpedo tubes; 80 mines; **Almirante Villar** (ex-Russian, 1918), 1,185 tons, 35 knots, 4 4-in., 1 2-pdr., 2 m., 3 18-in. triple torpedo tubes, 80 mines.

FRIGATES. (Ex-R.C.N.), **Teniente Ferre**, **Teniente Palacois**, **Teniente Galvez**, 1,445 tons, 20 knots.

SUBMARINES. **R-1-4** (U.S.A., 1926-28), 576/682 tons, 14·5/10 knots, 1 3-in. 4 21-in. torpedo tubes.

GUNBOATS. **Amazonas** and **Loreto** (Electric S.B. Co., 1934), 250 tons, 15 knots, 4 3-in. H.A., 2 ·8-in., 2 m.; **America** (1904), 350 tons, 14 knots, 2 3-pdr.; **Coronel Portillo** (ex-San Pablo, 1902), 49 tons, 7 knots, 2 3-pdr.; **Iquitos** (1875), rebuilt, 1896, 50 tons, 7·5 knots, 4 1·46-in., 2 ·8-in., 2 m.

TRANSPORTS. **Rimac** (ex-Eten, 1907), 6,848 tons gross, 12 knots, cargo capacity, 7,000 tons; **Callao**, 5,578 tons; **Tumbes**, 3,170 tons.

OILERS. **Parinas** (Thornycroft, 1921), 2,820 tons, 10 knots, carries 4,300 tons of oil; **Mariscal Castilla** (Montreal, 1942), 3,450 tons.

SUBMARINE CHASERS. 6 in number (ex-U.S.A.), **C.S. 1-6**, 45 tons, 24 knots, 1 20-mm.

TUGS. (Ex-U.S.S. Y.T.2, Y.T.3), **Tigre**, **Curaray**, 210 tons.

MINESWEEPERS. **Condestable Selendon**, **Jose Olaya**.

L.C.T.'s. **B.T. 1-4**.

PHILIPPINES

MINESWEEPER. (Ex-U.S.S. Quest), 1944, 900 tons, 16·5 knots, 1 3-in.

SUBMARINE CHASERS. 2 in number (ex-U.S. P.C.'s), 280 tons, 22 knots, 1 3-in.; 1 in number (ex-U.S. S.C.), 85 tons, 19·5 knots, 1 40-mm.

LANDING SHIP TANK. 4 in number (ex-U.S. L.S.T.'s), 8 40-mm.

COASTGUARD CUTTERS. 8 in number (ex-U.S.N.), 23 knots.

POLAND

DESTROYERS. **Blyskawica** (J. S. White, 1937), 2,144 tons, 39 knots, 8 4-in., 4 1·57-in., 2 triple 21-in. torpedo tubes; **Burza** (Chantiers Navals, 1932), 1,540 tons, 33 knots, 2 5·1-in., 1 2·9-in. H.A., 6 21·7-in. torpedo tubes.

- SUBMARINES.** **Sep** (Rotterdam, 1939), 1,090/1,450 tons, 14·5/11 knots, 1 4·1-in., 2 1·57-in. A.A., 12 21·7-in. torpedo tubes; **Zbik**, **Rys**, and **Wilk** (built in France, 1931–32), 965/1,230 tons, 14/9 knots, 1 3·9-in., 1 2-pdr. A.A., 6 21·7-in. torpedo tubes, 40 mines.
- MINESWEEPERS.** **Zuraw** (Gydnia, 1939); **Czajka** (Modlin, 1936); **Rybitwa** (Modlin, 1935), and **Mewa** (Gydnia, 1935), 140 tons, 15 knots, 1 3-in., 4 M.
- TRAINING SHIP.** **Iskra** (ex-British, 1917), Three Masted Schooner, 500 tons.
- MOTOR GUNBOATS.** 2 ex-British. **S.1** (J. S. White, 1940), 36 tons; **S.2** (B.P.B. Co., 1940).
- MOTOR TORPEDO BOATS.** 2 ex-Russian (1945), 38 knots, 1 20-mm., 2 torpedoes.
- MOTOR MINESWEEPERS.**—Ex-Russian (1945), **Albatross**, **Czapla**, **Jaskolka**, **Jastrzab**, **Kania**, **Kondor**, **Kormoran**, **Krogulec**, **Orlik**, 130 tons, 10 knots, 2 1·85-in. A.A.; 4 M.M.S.'s (ex-R.N. B.Y.M.S.'s), 290 tons, 14½ knots.
- TANKER.** **Stutthof**, 450 tons.
- WATERBOATS.** **Plehmendorf**, 500 tons.
- SUBMARINE CHASERS.** **Begwzgliedny**, **Blyskawiczny**, **Bystry**, **Dziarski**, **Dzielny**, **Karny**, **Niedoscigly**, **Nieuchwytny**, **Odwazny**, **Smialy**, **Sprawny**, **Szybki**, 40 tons, 28 knots, 1 20-mm.

PORTUGAL

- DESTROYERS.** **Douro**, **Tejo**, **Dao** (Yarrow, Lisbon, 1935–36), **Lima** and **Yauga** (Yarrow, Glasgow, 1933), 1,220 tons, 33,000 S.H.P., 36 knots, 4 4·7-in., 3 1·5-in. A.A. pom poms, 1 quadruple 21-in. torpedo tube, 20 mines, complement 164.
- MOTOR TORPEDO BOATS.** 6 in number.
- FRIGATES.** **Diego Gomez** (ex-R.N. Awe), **Nuno Tristad** (ex-R.N. Avon), 1,400 tons, 20 knots, 2 4-in., 5 20-mm.
- SUBMARINES.** **Golfinho**, **Espadarte**, **Delfim** (Vickers, 1934–35), 900/1,100 tons, 2,300/1,000 B.H.P., 16·5/9·2 knots, 1 4-in., 2 M., 6 21-in. torpedo tubes.
- GUNBOATS.** **Faro** and **Lagos** (Lisbon, 1928, 1932), 300 tons, 13 knots, 2 1·85-in.; **Zaire** (1927), **Diu** (1932), built at Naval Arsenal, Lisbon, 400 tons, 13 knots, 2 3-in., 2 3-pdr., 2 M.
- RIVER GUNBOATS.**—**Rio Minho** (Lisbon, 1904), 37 tons, 7·5 knots, 1 1-pdr., 2 M.; **Tete** (Yarrow, 1904), 70 tons, 7·5 knots, 2 3-pdr., 3 1-pdr.
- SLOOPS.** **Bartolomeu Dias** and **Afonso de Albuquerque** (Hawthorn Leslie, 1935), 1,780 tons, 21 knots, 3 4·7-in., 2 3-in. H.A., 4 pom poms, 2 depth charge throwers, 40 mines; **Joao de Lisboa** (ex-Infante don Henrique, 1937) and **Pedro Nunes** (1935), built at Lisbon, 1,080 tons, 17 knots, 2 4·7-in., 4 1·57-in. A.A., 2 depth charge throwers; **Goncalves Zarco** and **Goncalo Velho** (Hawthorn Leslie, 1933), 950 tons, 16·5 knots, 3 4·7-in., 2 1·57-in.

- TRAINING SHIP. **Sagres** (Bremerhaven, 1896), 3,100 tons, 7 knots.
- AUXILIARIES. **Vulcano** (Thornycroft, 1910), 500 tons, 12 knots; **Lidador** (Birkenhead, 1884), 200 tons, 9 knots, 2 3-pdr.; **Vale de Zebro**.
- PATROL VESSELS. **Azevia** (1941); **Bicuda**, **Corvina**, **Dourada**, **Espadilha**, **Fataca** (1942-44), 250 tons, 18 knots, 2 20-mm.
- SURVEYING SHIPS. **Carvalho Araujo** (ex-H.M.S. Jonquil, 1915), 900 tons, 17 knots; **Almirante Lacerda** (ex-Bangor Class), 1942, 672 tons; **Mandovi Ibo** (Lisbon, 1912-18), 400 tons, 13 knots.
- MINESWEEPING TRAWLERS. (Ex-Isles Class), **Faial**, **S. Miguel**, **Santa Maria** (1942), 545 tons, 12 knots, 1 12-pdr., 2 20-mm. (Ex-Tree Class), **Terceira** (1940), 545 tons, 1 12-pdr., 2 20-mm.; two others.
- LIGHTHOUSE TENDER. **Almirante Schultz** (Penhoey, 1929), 520 tons, 11.5 knots.
- TANKER. **Sam Braz** (1942), 7,000 tons (capacity 3,500 tons), 12 knots, 1 3.9-in. A.A.; one building.

ROUMANIA

- DESTROYERS. **Marasti** (ex-Italian Sparviero, 1917), and **Marasesti** (ex-Italian Nibbio), 1,460 tons, 40,000 S.H.P., 35 knots, 4 4.7-in., 4 1.46-in. H.A., 2 M., 2 double 18-in. torpedo tubes, 50 mines.
- MOTOR TORPEDO BOATS. **Viscolul** (ex-British, 1939), 70 ft. length, 30 tons, 41 knots, 8 M., 2 21-in. torpedo tubes. **Nos. 4, 5, 6, 7, 8, 9** (1939), 2 20-mm.
- TORPEDO BOATS. **Sbornul** and **Zmeul** (ex-Austrian, 1913-14), 260 tons, 28 knots, 1 2.6-in., 1 1.46-in., 2 torpedo tubes in **Sbornul**.
- SUBMARINES. **Delfinul** (Fiume, 1936), 700/950 tons, 1,600/1,300 S.H.P., 14/9.5 knots, 1 4.2-in., 6 21-in. torpedo tubes.
- RIVER MONITORS. **Ioan Bratianu** (Trieste, 1907-08), 680 tons, 13 knots, 3 4.7-in., 1 3-in. A.A., 2 1.85-in., 4 M.; **Bucovina** (ex-Austrian Sava, Budapest, 1916), 550 tons, 12 knots, 2 4.7-in., 2 4.7-in. howitzers, 2 2.6-in. A.A., 2 1.85-in., 6 M.; **Basarabia** (ex-Austrian Inn, Budapest, 1915), 590 tons, 12 knots, 2 4.7-in., 2 4.7-in. howitzers, 2 1.85-in., 9 M.; **Ardeal** (ex-Austrian Temes, Budapest, 1904), 450 tons, 10 knots, 2 4.7-in., 1 3.5-in. A.A., 2 1.85-in., 2 M.
- GUNBOATS. **Stihi** (ex-French Friponne, Lorient, 1917); **Ghiculescu** (ex-French Impatiente, Brest, 1916), 350 tons, 15 knots, 2 3.9-in., 2 M.
- PATROL BOATS. **Nos. 3 and 7** (Thornycroft, 1908), 100 ft., 50 tons, 18 knots, 1 3-pdr., 1 M.
- RIVER GUNBOATS. **Bistritsa Oltul**, and **Siretul** (Blackwall, 1888), 100 tons, 12 knots, 1 6-pdr., 1 1-pdr. 8 in number, launches (1921), 9 tons.
- YACHTS. **Luceafarul** (Glasgow, 1931), 1,580 tons, 17 knots; **Taifun** (Royal Yacht) (J. S. White, 1938), 34 tons; **Macin**, 1912.
- TRAINING SHIP. **Mircea** (Hamburg, 1939), 1,750 tons, 10 knots.
- MOTOR BOATS. 7 in number (some armoured), 40 tons, 14 knots.
- ARMED MOTOR LAUNCHES. 10 in number, 9-30 tons.
- VEDETTEs. **Nos. 1, 3, 4** (1906), 49 tons, 1 1.85-in., 1 20-mm.

THAILAND

DESTROYER. **Phra Ruang** (ex-British *Radiant*, Thornycroft, 1917), 718 tons, 29,000 S.H.P., 35 knots, 3 4-in., 1 2-pdr. pom pom., 1 m., 2 double 21-in. torpedo tubes.

TORPEDO BOATS. **Chumporn, Pattani, Surasdra, Chandaraburi, and Rayong** (Monfalcone, 1937), 470 tons, 10,000 S.H.P., 31 knots, 3 3-in. A.A., 4 8-in. m., 6 18-in. torpedo tubes; **Puket and Trad** (Trieste, 1936), 380 tons, 9,000 S.H.P., 31 knots, 3 3-in. A.A., 4 8-in. m., 6 18-in. torpedo tubes.

MOTOR TORPEDO BOATS. 8 in number (Thornycroft, 1930-35), 55 ft., 13.5 tons, 2 torpedoes.

SUBMARINES. **Blai Jumbol, Sinsamudr, Machanu, Virun** (Mitsubishi, 1938), 325 tons, 14.5/8 knots, 1 m., 5 21-in. torpedo tubes, complement 24.

GUNBOATS. **Dhamburi and Sri Ayudhya** (Kobe, 1938), 2,000 tons, 15.5 knots, 4 8-in., 4 3-in.; **Ratnakosindr** (Armstrong, 1925), 890 tons, 12 knots, 2 6-in., 4 3-in. H.A., 2½-in. armour belt.

CORVETTES. **No. 2** (ex-H.M.S. *Burnet*); **No. 3** (ex-H.M.S. *Betony*), 1,000 tons, 16.5 knots, 1 4-in., 3 20-mm., purchased 1947.

AUXILIARY VESSELS. 6 ex-U.S.N. L.C.M.'s, 20 tons, 7½ knots, 1 in number, ex-U.S.N. L.C.I., 233 tons, 14 knots, and seven others.

MINELAYERS. **Bang Rachan (S1) and Nong Sarai (S2)** (Monfalcone, 1936), 368 tons, 12 knots, 2 3-in., 140 mines.

PATROL BOATS. **Klongyai, Takbai, and Kantang** (Yokohama, 1937), 110 tons, 18 knots, 1 3-in., 3 8-in. m., 2 18-in. torpedo tubes, and 6 C.M.B.'s.

TRAINING SHIPS. **Maeklong** (Uruga, 1937), 1,400 tons, 17 knots, 4 4.7-in., 2 5-in. m. A.A., 2 double 12-in. torpedo tubes, 20 mines; **Chao Phra** (ex-British *Havant*, 1918), 700 tons, 16 knots.

FISHERY PROTECTION VESSELS. **Sara Sindhu, Thiew Uthok, Travane Vari** (Bangkok, 1936), 50 tons, 9.5 knots, 1 1.5-in. 6 of M.F.V. type.

TUG. **Samet** (ex-Pi-Sua-Nam), 90 tons, 9.5 knots.

TRANSPORTS. **Pagan and Sichaun** (Harima, 1938), 650 tons.

OIL TANKER. **Samui** (Hakodate, 1936), 1,800 tons, 12 knots.

MINESWEEPER. (Algerine Class, ex-H.M.S. *Minstrel*), 1,000 tons, 1 4-in., 8 20-mm.

TURKEY

BATTLE CRUISER. **Yavouz Sultan Selim** (ex-Goeben, Hamburg, 1912), 22,734 tons, 52,000 S.H.P., 27 knots, 10 11-in., 10 5.9-in., 8 3.5-in., A.A., 14 1.5-in. m.p.p., 4 m., 4 19.7-in. torpedo tubes, complement 1,000.

CRUISERS. **Hamidieh** (Armstrong, 1904), 3,790 tons, 12,000 H.P., 22 knots, 2 5.9-in., 6 3-in., 8 3-in. H.A., 2 18-in. torpedo tubes, 70 mines; **Medjidieh** (ex-Russian *Prutt*, Cramp, 1904), 3,300 tons, 12,000 H.P., 22 knots, 4 5.1-in., 2 3-in. H.A., 4 m. (Both used as training ships.)

DESTROYERS. **Gayret** (ex-H.M.S. Oribi, Fairfields, 1941), 1,540 tons, 34 knots, 4 4·7-in., 1 4-in., 4 2-pdr., 8 21-in. torpedo tubes; **Kocatepe** and **Adatepe** (Ansaldo, 1932), 1,300 tons, 38,000 S.H.P., 38 knots, 4 4·7-in., 3 2-pdr. H.A., 3 M., 6 21-in. torpedo tubes, 40 mines; **Tinaztepe** and **Zafer** (Riva Trigoso, 1932), 1,240 tons, 50,000 S.H.P., 38 knots, 4 4·7-in., 3 2-pdr. A.A., 2 triple 21-in. torpedo tubes; **Sultan Hisar** and **Demir Hisar** (Denny Bros., 1941); **Muavenet** (ex-H.M.S. Inconstant) (Vickers, 1941), 1,370 tons, 34,000 S.H.P., 35 knots, 4 4·7-in., 6 1·5-in. A.A., 2 quadruple 21-in. torpedo tubes.

TORPEDO BOATS. **Berk** (ex-Berkisatvet) and **Peyk** (ex-Peikishevket, Kiel, 1907), 830 tons, 20 knots, 2 4-in., 4 6-pdr., 2 1-pdr., 2 M., 3 18-in. torpedo tubes, 30 mines.

MOTOR TORPEDO BOATS. 10 in number, 18 tons, 32 knots. 6 in number (1945), 35 tons, 30 knots.

MOTOR LAUNCHES. A number of ex-British Fairmiles.

PATROL MOTOR BOATS. **Doghan**, **Marti**, and **Deniz Kusu** (Venice, 1932), 31 tons, 34 knots, 1 3-in., 1 1-in. pom pom, 2 18-in. torpedo tubes, 6 depth charges. A number building.

SUBMARINES. **Sakarya** (ex-U.S.S. Blueback); **Gur** (ex-Boarfish); **Birinci İnönü** (ex-Brill); **İkinci İnönü** (ex-Chubb), 1,526 tons, 10 21-in., 21 knots on surface; **Burak Reis**, **Murat Reis**, **Oruc Reis** (Vickers, 1941), 624/856 tons, 1,200/708 H.P., 13·7/8·4 knots, 1 4-in., 3 M., 5 21-in. torpedo tubes; **Yildiray** (Istanbul, 1941), **Saldiray** (Kiel, 1939), 820/1,100 tons, 4,800 H.P., 20/9 knots, 1 4-in., 6 21-in. torpedo tubes, 40 mines; **Dumlupınar** (Monfalcone, 1932), 935/1,220 tons, 2,400/1,400 H.P., 15/9·5 knots, 1 4-in. H.A., 3 M., 4 21-in. torpedo tubes, 40 mines; **D8** (ex-Gur) (Cadiz, 1931), 750/960 tons, 2,800/1,000 H.P., 20/9 knots, 1 4-in., 1 8-in. M., 6 21-in. torpedo tubes; **D5** (ex-Inönü I) and **D6** (ex-Inönü II) (Rotterdam, 1928), 433/556 tons, 1,100 H.P., 13·5/8·5 knots, 1 3-in. H.A., 1 M., 6 17·7-in. torpedo tubes; **D7** (ex-Sakarya) (Monfalcone, 1932), 610/940 tons, 1,500/1,100 H.P., 14·5/9·3 knots, 1 4-in., 1 8-in. M., 6 21-in. torpedo tubes.

SUBMARINE DEPOT SHIPS. **Erkin** (ex-S.S. Trier, Bremen, 1923), 16,000 tons, 12·5 knots, 2 M.; **Akin** (ex-Rasit; Smith's Dom Co., 1913), 33 tons, 12 knots; **Marmora** (ex-R.S. Syria, 1906), 1,500 tons.

MINESWEEPERS. (Bathurst Class, ex-R.A.N.) **Ayancik**, **Amasra**, **Ayvalick Antalya**, **Alanya** (1942), 650 tons, 2,000 H.P., 1 12-pdr.; **Hizir Reis**, **Issa Reis**, and **Kemal Reis** (La Seyne, 1912), 443 tons, 14 knots, 3 3-in., 2 3-pdr., 2 M.; 4 Motor Minesweepers (ex-British), **Bartin**, **Budrum**, **Bandirma**, **Bafra**, 255 tons, 12 knots; **Kavak**, **Canak** (1937), 52 tons, 15 knots. (Ex-R.N. lease-lend vessels subsequently purchased by Turkey), **Candarti**, **Carshauba**, **Cardak**, **Ceshme**, **Endremi**, **Ederik**, **Ereyle**, **Eredemli**, 1,100 tons, 18 knots, 1 3-in., 6 20-mm.

MINELAYERS. **Sivri Hisar** and **Torgud Reis** (ex-Yuzbashi Hakki) (Thornycroft, 1940), 350 tons, 15 knots, 1 3-in., 80 mines; **Atak** (Ismidt, 1940), 500 tons, 13 knots, 40 mines; **Nusret** (ex-Yardim, Kiel, 1913), 360 tons, 15 knots, 2 M., 25 mines; **Uyanik** (ex-Intibah, Port Glasgow, 1886), 600 tons, 12 knots, 50 mines. Several others.

OIL TANKERS. **Gölück** (Ismidt, 1937), 1,400 tons, 10 knots, 750 tons capacity; **Beykoz**, 435 tons (gross).

YACHTS. **Savarona** (ex-Gunes Dil, Hamburg, 1931), 5,700 tons, 21 knots, 2 3-pdr.; **Ertougrul** (Armstrong, 1903), 900 tons, 21 knots, 8 3-pdr.; **Acar**, 63 tons, 12.5 knots; **Sugutli** (1903).

GUNBOAT. **Aidin Reis** (St. Nazaire, 1913), 502 tons, 14 knots, 2 4-in., 2 6-pdr., 4 M.

MOTOR LAUNCHES. 8 in number, ex-R.N. H.D.M.Ls.; 12 in number, German.

TUG.

URUGUAY

TORPEDO GUNBOAT. **Uruguay** (Stettin, 1910), 1,150 tons, 23 knots, 2 4.7-in., 4 3-in., 6 1-pdr., 4 M., 2 18-in. torpedo tubes.

PATROL BOATS. **Paysandu**, **Salto**, and **Rio Negro** (Ancona, 1935), 150 tons, 16 knots, 2 3-in., 2 M.

SURVEYING SHIP. **Capitan Miranda** (Cadiz, 1930), 516 tons, 12 knots.

TENDERS. **Zapican** (ex-Atlantico, 1911), 162 tons, 10 knots; **Van-guardia** (Glasgow, 1908), 95 tons, 12 knots, 2 1.5-in.; **Huracán** (ex-Fortuna, 1879), 197 tons, 12 knots; **Corsario**, 130 tons.

TRAINING SHIPS. **Aspirante** (ex-Exir Dallen, 1919), 250 tons, auxiliary motor; **Diez Ocho de Julio**, 764 tons, 12 knots.

SUBMARINE CHASER. **Maldonado** (ex-U.S.N. P.C. 1234), 280 tons, 22 knots, 2 3-in., 1 40-mm.

VENEZUELA

GUNBOATS. **General Soublette** (ex-Italian Dardanelli) and **General Urdaneta** (ex-Italian Milazzo) (Monfalcone, 1926), 615 tons, 15 knots, 2 4-in., 1 3-in. H.A., 80 mines.

CORVETTES. (Ex-R.C.N. Flower Class), **Independencia**, **Constitucion**, **Federation**, **Patria**, **Victoria**, **Libertad**.

TUGS. **Aragua** (ex-Caroni), 154 tons, 7 knots, 1 M.; **José Felix Ribas** (ex-Zumbador, 1894), 300 tons, 10 knots, 2 6-pdr., 1 M.

RIVER GUNBOATS. 2 in number.

YACHT. **Leandro** (ex-Dr. Brinkley, U.S.A., 1925), 320 tons, 18 knots, 2 1.46-in.

PATROL VESSELS. (Ex-U.S. C.G. Cutters, 1944), **Antonio Diaz**, **Brion**, **Briceno Mendez**, **Arimendi**, 53 tons, 23.5 tons, 1 20-mm.

COASTGUARD VESSEL. **Torbes** (building).

TRANSPORT. **Capana** (ex-U.S. L.S.T. 907), 11 knots, used as training ship.

YUGOSLAVIA

DESTROYERS. 1 in number (building at Split), 1,875 tons, 38 knots, 5 5.5-in., 10 1.57-in. A.A., 2 M., 6 21-in. torpedo tubes. Two others building.

CORVETTE. **Nada** (ex-H.M.S. Mallow), 1,000 tons, 16 knots, 1 4-in.

TORPEDO BOATS. **T. 1** and **T. 5** (ex-Austrian, 1913-15), 200 tons, 5,000 S.H.P., 28 knots, 2 2·5-in. A.A., 2 M., 2 21-in. torpedo tubes; ex-Italian **Ariete**, **Balestra**, **Fionda** (1943), 797 tons, 2 3·9-in., 6 21-in. tubes; ex-Italian **Aliseo**, **Indomito** (1943), 950 tons, 3 3·9 in., 25 knots.

MOTOR TORPEDO BOATS. **Durmitor**, **Kajmakcalan** (Bremen, 1936-37), 92 ft., 62 tons, 34 knots, 1 1·57-in. A.A., 2 21-in. torpedo tubes; **M.T. 1-8** (ex-U.S.N. P.T. boats), 46 tons, 1 40-mm., 1 20-mm., 2 torpedoes. Several others presented by U.S.S.R.

SUBMARINES. **Hrabi** and **Nebojsca** (Armstrong, 1928), 870/1,146 tons, 2,400/1,600 B.H.P., 15/10 knots, 2 4-in., 6 21-in. torpedo tubes. 6 others reported acquired from U.S.S.R.

RIVER MONITORS. **Dragor** (1928), 250 tons; **Cer** (1909), 256 tons.

MINELAYERS. **Galeb**, **Kobac**, **Orao**, **Sokol** (ex-German M class, 1918-19), 330 tons, 15 knots, 2 3·9-in. H.A., 2 M., 40 mines.

MINESWEEPERS. **Malinska**, **Marjan**, **Meljine**, **Mljet**, and **Mosor** (Yarrow, Kraljevica, 1931-32), 130 tons, 9 knots, 1 2·5-in. A.A.; **Dz** (ex-Austrian, 1889), 78 tons, 17 knots, 2 1·45-in., 1 M.; **Pionir** (Fiume, 1946), 530 tons.

SEAPLANE TENDER AND DEPOT SHIP. **Zmaj** (Hamburg, 1929), 1,870 tons, 15 knots, 1 4-in. A.A., 10 seaplanes.

SUBMARINE DEPOT SHIPS. **Hvar** (ex-Vintali, Sunderland, 1896), 2,000 tons, 13 knots; **Sitnica** (ex-Najade, 1891), 370 tons, 9 knots, 2 3-pdr.

SALVAGE VESSEL. **Spasilac** (Kiel, 1930), 740 tons, 15 knots.

TRAINING SHIP. Three masted schooner **Jadran** (Hamburg, 1933), 710 tons, auxiliary motor, 8 knots, 2 2-pdr.

YACHTS. **Vila** (ex-Dalmata, 1896), 230 tons, 12 knots; **Dragor** (1928), 250 tons, 10 knots.

TUGS. **Ponderoso** (ex-Jaki) (1915), 360 tons, 15 knots, 2 1·85-in.; **Mocni** (Antwerp, 1939), 260 tons, 11 knots, 2 1·85-in.; **Silni** (1914), 200 tons, 10 knots, 2 1·85-in.; **Marljivi** (1898), 130 tons, 10 knots; **Snazni**, 100 tons, 10 knots; **Ustrajni** (1917), 160 tons, 9 knots; **Cer** (1909), 250 tons, 15 knots, 2 M.; **Sisak** (ex-Triglav, 1915), 90 tons, 11 knots, 2 M.; **Sabak** (ex-Avala), 90 tons, 8 knots, 2 M. (last three used as River Monitors).

PATROL BOATS. **Granicar** and **Strazar** (1929), 36 tons, 9 knots, 1 3-pdr.

OILER. **Perun**, 4,500 tons, 4 40-mm., 10 knots.

MISCELLANEOUS

STATEMENT ON DEFENCE 1949

(Cmd. 7631)

I.—INTRODUCTION

1. The defence problem of to-day has three main features. First, there is the basic task of reconstruction, of building and equipping new and efficient units from the residue of our war-time Forces and of fitting them into the framework of a long-term national defence plan—a plan which must allow for the introduction of new weapons and be appropriate to our obligations to the Commonwealth and Western Union and to any future arrangements concluded for the defence of the North Atlantic area. Secondly, there is the task of maintaining our existing Forces from day to day in a condition in which they could resist aggression if suddenly and unexpectedly called upon to do so. Thirdly, and concurrently with the above tasks, arrangements must be made to meet a whole range of current commitments—the provision of Forces of Occupation in Germany, Austria, and Trieste; the extra Forces necessary to reinforce the local security measures in such areas as Malaya, Hongkong, West Africa, and some of the ex-Italian Colonies; and finally the normal range of burdens which falls to the Armed Forces as a matter of course in peace-time.

2. This Statement describes the main developments over the past year (Section II), the progress of our arrangements for co-operation within the Commonwealth and with other countries (Section III), and our plans and intentions regarding the development of our National Forces over the coming year (Sections IV–IX).

II.—DEVELOPMENTS IN THE PAST YEAR

3. In the autumn of 1948 the reconstituted Home Fleet carried out a cruise to the West Indies. The appearance in those waters of H.M.S. Duke of York with cruisers and destroyers in company was an encouraging sign of the recovery of our naval strength. During this cruise the White Ensign was seen in the United States of America, and aircraft carriers and destroyers visited South Africa. In other parts of the world the Royal Navy has shouldered its customary responsibility for lending speedy aid in difficult situations: the landing of Marines from H.M.S. Sheffield in British Honduras in support of the local administration; the visit of H.M.S. Nigeria to the Falkland Islands Dependencies; the cover provided for the evacuation from Palestine by units of the Mediterranean Fleet, including the employment of the Royal Marine Commando Brigade in the final phase; the despatch of sloops when disturbances were feared in West Africa; the support of our land forces in Malaya and Transjordan. These illustrate the calls made upon the Royal Navy during the year, all of which our seamen and Marines met with their customary efficiency, promptitude, and skill. The study and practical exploration of new possibilities in the art of naval warfare have continued to receive close attention.

The large-scale exercise of the Home Fleet in co-operation with the Royal Air Force and the Army in December last was designed to try out Fleet dispositions against the threat of atomic bombing and to test the organisation for defending our shores against sea-borne attack. Of no less significance are the cold-weather trials carried out in northern waters by an aircraft carrier, destroyers, submarines, and other vessels, designed to test the latest equipment under the rigorous conditions of the Arctic.

4. The Army has met the many calls placed upon it all over the world. A large garrison is required in Germany, and in beleaguered Berlin British soldiers with their French and American comrades afford to the people of that city visible evidence of our determination not to abandon them. At the same time our occupation commitments in Trieste and Austria continue. Meanwhile new situations in Malaya due to Communist-inspired terrorism, in Hongkong as a result of the developments in the Chinese civil war, and in Transjordan owing to the invocation by that country of the Anglo-Transjordan Treaty have required the despatch of British troops to those areas. Our commitments have also continued in Greece and in the ex-Italian colonies of Africa. The redistribution of the troops in the Middle East consequent upon the withdrawal from Palestine—a considerable operation in itself—has created difficult problems of reorganisation. Amid all these pre-occupations the work of rebuilding the new Army has proceeded. In particular, measures have been put in hand to ensure that the Territorial Army organisation is developed to allow it to handle the National Service reservists who will begin to enter it in the middle of 1950.

5. The Royal Air Force, while engaged in the work of reconstruction, has had to meet the unexpected demands of the Berlin air lift. The achievements of the Royal Air Force Transport Command crews in association with the United States Air Force and British civil aircraft, and aided by aircrews from Australia, New Zealand, and South Africa, in maintaining the life of the Western Sectors of Berlin since June and throughout the winter are a remarkable story of sustained and successful endeavour. The strain has been great. Flying personnel and ground staffs in all categories and trades have combined to overcome difficulties and have succeeded in giving a demonstration of outstanding vigour, organisation, and efficiency. Support for the evacuation of Palestine, three brief operations in the hinterland of Aden, support for police and military Forces in Eritrea and now in Malaya are further tasks which have fallen to the Royal Air Force. In the meantime training has not been neglected. All the Home Commands and British Air Forces of Occupation, including the Royal Auxiliary Air Force squadrons, took part in operation "Dagger," designed to exercise the early warning and fighter control systems. Exercises by Bomber Command included the periodical detachment of squadrons to the Mediterranean. Of many goodwill visits to other countries perhaps the most notable was the first crossing of the Atlantic by jet aircraft when the Vampires of No. 54 Squadron visited the United States of America and Canada.

6. Combined Operations activities have continued throughout the year. The Combined Operations Schools have concentrated on the training and operational sides of the work, and various demonstrations and visits have been arranged. The outstanding demonstrations were those given by a Commando Brigade at Malta to an Allied audience, by the Amphibious

School at Portsmouth to the Staff Colleges, and one of close assault given by the Commandos near Falmouth. There have also been two inter-Service exercises with a Beach Brigade. The Home Combined Training Squadron, with specialist detachments embarked, sailed from the United Kingdom and carried out exercises with the troops stationed in the Middle East and with the garrison at Gibraltar. Close liaison with the United States of America has been maintained. There has been an interchange of visits by officers connected with Combined Operations in the two countries and a team from the Combined Operations School has visited the United States Marine Corps School at Quantico as well as the Canadian Staff College at Kingston, Ontario.

7. Developments in Civil Defence organisation are outside the scope of this Statement. Close contact is maintained between the Ministry of Defence and the authorities responsible under the Civil Defence Act, 1948, for the planning of measures for the protection of the civil population, and a great deal of work is being done in this sphere. The fact that the annual Army Staff exercise is to be based this year on this aspect of defence of the United Kingdom shows the importance which is attached to the whole matter of civil defence.

III.—CO-OPERATION WITHIN THE COMMONWEALTH AND WITH OTHER COUNTRIES

8. The Charter of the United Nations defines as one of its main purposes the maintenance of international peace and security. To this end it lays down a procedure for ensuring the pacific settlement of international disputes and makes provision for resort if need be to collective action with respect to threats to the peace, breaches of the peace, and acts of aggression. The general concept includes the building up of United Nations Armed Forces under the control of the Security Council to be used if need be for these purposes.

9. His Majesty's Government have from the outset done everything in their power to promote and assist this primary aim of the United Nations and will continue to do so. The degree of success realised has, however, proved a grievous disappointment and the establishment of collective security on a world-wide basis under the United Nations has not been achieved. In these circumstances, His Majesty's Government have necessarily devoted increased attention to co-operation with other members of the Commonwealth, the United States of America, and other like-minded powers, and generally to the development of appropriate regional security arrangements as contemplated in Article 51 of the United Nations Charter.

COMMONWEALTH

10. The meeting of Commonwealth Prime Ministers, which was held in London in October, 1948, provided the opportunity for a valuable review of defence problems facing the various countries of the Commonwealth.

11. There was general approval of the existing arrangements for consultation between Commonwealth countries on defence matters. Recommendations for improving these arrangements have been submitted to the Governments for consideration, and substantial progress has been made in

establishing a basis on which military co-operation could be developed. In consequence, His Majesty's Government in the United Kingdom hope that it will now be possible further to improve, within the framework acceptable to each individual Commonwealth Government, arrangements for military co-operation and for consultation on military planning.

12. Planning and consultation have taken place between individual Commonwealth authorities in respect of various areas which are of concern to them, and there have been frequent exchanges of visits by officers, officials, and scientists between the countries of the Commonwealth.

13. Colonial Governments are already devoting an appreciable part of their resources to the maintenance of local defence Forces. To prevent the dissipation of our armed strength and to free the United Kingdom Forces for their true role, local Forces must be built up to the extent necessary to deal with the present disturbed conditions. His Majesty's Government, in conjunction with the Colonial Governments concerned, are therefore examining the size and composition of the local Forces required.

WESTERN UNION

14. In this sphere the most significant step has undoubtedly been the setting up of machinery to give effect to the defence obligations assumed by the Western Union Powers under the Treaty signed at Brussels in March, 1948. The fulfilment of these obligations gives rise to many novel problems, but substantial progress has been made in a period of less than 12 months. The whole-hearted co-operation which has been developed is a good augury for the future.

15. Under the general guidance of the Defence Ministers of the five Powers concerned, a Western Union defence organisation has been set up providing for the co-ordination of defence measures in the military and supply fields and for the study of the tactical problems of the defence of Western Europe. In addition the defence organisation provides the framework on which, in the event of an emergency, a command organisation could be built up.

16. The Committee of Defence Ministers is assisted, on the side of strategy and plans, by a Western Union Chiefs of Staff Committee, and as regards supply by a Western Union Military Supply Board.

17. The Western Union Chiefs of Staff Committee has taken as its permanent staff the Military Committee organisation which has been working in London since May, 1948. Inter-Service subjects are dealt with by planning staffs which have functions similar to those of the joint staffs which serve the United Kingdom Chiefs of Staff. Subjects which affect a single Service are dealt with by the three Service Advisory Committees, which deal direct with the respective Service Departments in each country for executive action. Detailed technical problems are dealt with by sub-committees whose members are drawn from the Service Departments of the five countries.

18. A Western Europe Commanders-in-Chief Committee has been established under the chairmanship of Field-Marshal Viscount Montgomery of Alamein. The position of Commander-in-Chief Land Forces Western Europe is held by Général d'Armée de Lattre de Tassigny; that of Commander-in-Chief Air Forces Western Europe is held by Air Chief

Marshal Sir James Robb; and Vice-Admiral Jaujard has been appointed Naval Representative with the title of Flag Officer Western Europe. The main task of this body is to study the tactical problems of the defence of Western Europe. It will not assume executive command of any Forces in peace-time.

19. The Western Union Military Supply Board works in close co-operation with the Western Union Chiefs of Staff Committee, the Chiefs of Staff dealing with the shape and size of the forces to be maintained and formulating requirements for weapons and equipment, and the Supply Board with ways and means, including plans for the development of a balanced war potential at the disposal of the Western Union countries. The Board has a permanent staff which comprises representatives of each country and is directed by a Supply Executive Committee. This latter body and its sub-committees work in close co-operation with the Military Committee and its sub-committees.

20. A broad review of the present defence production capacity of each of the five countries has been made and plans have been developed for equipping the air defence forces of Western Union. Meteors or Vampires are being supplied to France, Belgium, and Holland, and arrangements are well advanced for the manufacture of these aircraft in these countries under licence. British ground radar equipment is also being supplied from the United Kingdom for an integrated early warning system.

21. United States and Canadian observers attend meetings of the Western Union Chiefs of Staff Committee, the Military Supply Board and the subordinate committees which work for these two bodies.

22. A Finance and Economic Committee has been created to work in close co-operation with the Western Union Chiefs of Staff Committee and the Western Union Military Supply Board on problems affecting the interchange of supplies and services between the defence Forces of the Five Powers.

DEFENCE OF THE NORTH ATLANTIC AREA

23. The signature of the Brussels Treaty and the developments which have followed are important achievements which illustrate the growing cohesion of the peace-loving countries of Western Europe. But the defence of Western Europe can only be treated realistically if considered in due relationship to the wider problems of the defence of the North Atlantic area. For this reason His Majesty's Government are participating in discussions which are now taking place in Washington with the object of developing the conception of regional defence and reaching a collective arrangement within the framework of the Charter of the United Nations for the North Atlantic area.

IV.—FINANCE

24. The cost of building up the Forces needed to implement our defence policy and to shoulder the tasks described earlier in this Statement is inevitably heavy. Its very magnitude reflects our determination to play a part appropriate to our national strength and responsibilities. An important part of the heavy cost is due to the responsibility for administering occupied territories which devolved on us at the end of the war and to

the extra Forces which we have had to send abroad to reinforce local security measures. These developments have resulted not only in a high proportion of the Armed Forces being located overseas but also in their being to an important extent dispersed in comparatively small groups over very wide areas. These factors and the added overheads associated with them have contributed heavily to the size of the Defence Budget.

25. The net financial provision for defence purposes proposed for 1949-50 is as follows:

	<i>£ million</i>					
Admiralty	189.25
War Office	304.70
Air Ministry	207.45
Ministry of Supply	57.75
Ministry of Defence71
Total	<u>759.86</u>

A broad analysis of the Defence Budget arranged in a form closely related to the common Votes of the Army and Air Estimates is given in Annex II.

26. Excluding war terminal charges the Ministry of Supply defence expenditure in 1948-49 amounted to about £49.25 million. There is no longer any need to provide for terminal charges this year, and the increase of £8.5 million is chiefly on account of defence research and development and to a less degree on departmental expenses on new procurement.

27. The Defence Budget has now been relieved of the cost of several immediate post-war activities. There is no longer any provision for expenditure on the administration and control of prisoners of war and certain responsibilities in respect of the occupied territories in Africa are being transferred to a Civil Department.

28. In the total Defence Budget of £759.86 million war terminal charges account for £13.26 million compared with £60.51 million in 1948-49. The figure of £13.26 million does not include the cost of release leave pay and allowances of men called up after January 1, 1947, which are regarded as normal charges. The main items are £1.37 million for the Polish Resettlement Corps, £1.03 million for release benefits of men called up before January 1, 1947, £9.16 million for works and lands charges, and £1 million for termination of contracts.

29. Excluding war terminal and non-effective charges and the cost of those non-military activities of which the Service Votes have now been relieved, the remaining provision in the three Service Estimates for 1948-49 stood at about £547 million. The comparable figure this year is about £654.5 million. Of the increase of about £107.5 million, approximately one-third is accounted for by increased Service rates of pay, by increased civilian wages, by the increased cost of insurance charges for Servicemen and civilians, and by higher prices for supplies. Increased expenditure on the Reserve and Auxiliary Forces accounts for more than £5 million, and the bulk of the balance is accounted for under the heading of equipment. This extra provision for equipment is largely attributable to the emergency measures authorised in September, 1948, but the trend in this direction will become more pronounced as time goes on. There are three reasons for this. First, we can no longer rely to the same

extent on surplus war stocks, which are in any event getting steadily older and more unbalanced. In many cases the stocks held against future Service requirements have now been used up and new production has become necessary not only to meet current maintenance needs but also to build up reserves to the minimum level necessary to guard against a sudden emergency. Even where substantial supplies remain over from the war, as, for example, of vehicles, considerable expenditure on overhaul and repair is required to restore them to a serviceable condition. The vast quantities of equipment handed in on demobilisation were mostly in need of overhaul. They could not be serviced at the time without serious dislocation of the demobilisation scheme; nor could they be housed at peace-time standards without making unacceptable calls on civilian storage accommodation. The work of overhaul, which has gone on continuously, must now be accelerated to cope with the increasing demands for current use. Secondly, we must proceed with providing the Forces with some of the improved arms and equipment demanded by the conditions of modern warfare. Finally, the cost of equipment has increased greatly. Apart from the increase in the actual production costs of standard articles, which has been considerable even in the last two or three years, the increasing number and complexity of equipments now in use have magnified the expense of fitting out a unit or formation with new equipment.

30. Of the increase of about £81,000 in the Ministry of Defence Estimates, £25,000 consists of expenditure previously borne on other Votes and £52,000 relates to secretarial and common service arrangements for Western Union establishments located in London. Other expenditure arising from United Kingdom activities in Western Union (for example, on account of the British Service personnel who are full-time members of the various staffs and committees) is included in the separate Service Estimates.

V.—MAN-POWER

31. Since the end of hostilities the Armed Forces have had to face three concurrent man-power tasks: first, to disperse the huge war-time Forces; secondly, to build up the peace-time regular strength; and, thirdly, to maintain adequate numbers to meet current commitments. With the release of the last of the age-and-service groups the first task may be considered complete. The second is a slower process since there was a cessation of regular recruiting during hostilities, and the attraction of returning to their homes with a certainty of employment resulted, very understandably, in a comparatively small proportion of men with war service remaining as regulars. The third has necessitated, and still necessitates, the training and employment of large numbers of National Service men.

32. Between June, 1945 and April, 1949, when the age-and-service release scheme is due to end, the strength of the Forces will have fallen from well over five millions to roughly 793,000. During this period some 5½ million men and women will have been released from the Forces. The intake of recruits and National Service men will have amounted to more than a million. Hundreds of thousands will have joined and passed through the Services since demobilisation started.

33. The inevitable effect is that the Services all suffer from lack of men

with long experience or a high degree of Service skill, although in the event of an emergency large reserves are at present available from among the trained men and women who served in the recent war. The dominant needs to-day are to conserve the present reduced body of skill and experience, and to build up by regular recruitment and training and by re-engagement. With the greater stability of numbers which is now approaching, special efforts will be directed to this end.

STRENGTH OF THE FORCES IN 1949-50

34. As a result of the decision to suspend releases from the Forces for three months and to increase the period of full-time National Service from 12 to 18 months, the reductions in the Forces during 1948-49 contemplated in the Statement Relating to Defence 1948 will not be achieved. Instead of a total strength of 716,000 on April 1, 1949, as given in Annex I to that White Paper, it is estimated that the figure on April 1, 1949, will be 793,000. The total fall in strength during the financial year 1948-49 will be about 138,000. Releases during that year will number about 375,000.

35. The intention is that by the end of the financial year 1949-50 the strength of the Forces will be about 750,000. The following table shows the numbers that are expected to be borne in the three Services at the beginning and end of the financial year:

				<i>April 1, 1949</i>	<i>March 31, 1950</i>
Navy	..	..	..	145,000	146,000
Army	..	..	..	416,000	391,000
Air Force	..	..	..	232,000	213,000
				<hr/> 793,000 <hr/>	<hr/> 750,000 <hr/>

NATIONAL SERVICE

36. In accordance with the provisions of the National Service Acts, National Service men called up in 1949 will be liable for part-time service from mid-1940 onwards. By that time it will be necessary to have reduced the length of service of National Service men called up in 1947 and 1948 from the current period of not more than 27 months to 18 months. A revised table giving the maximum period to be served by all those called up in 1947 and 1948 has been published.

37. The man-power plan for 1949-50 provides for the call-up of 174,000 National Service men divided as follows:

Navy	..	..	..	..	..	..	10,000
Army	..	..	..	..	..	..	120,000
Air Force	..	..	..	..	..	..	44,000

These numbers are rather more than the numbers accepted last year. The age of call-up throughout the financial year will remain at 18 years 3 months and will not be increased to 18 years 6 months by the process of dropping one of the four annual registrations, as was suggested in the Statement Relating to Defence, 1948. The longest possible notice will be given of the registration programme and the programme for the whole of 1949 has already been announced. The numbers becoming available

for call-up in 1950 and later will be appreciably increased by men whose periods of deferment expire, and it is probable that it will again become necessary to raise the age of call-up in order to restrict the intake to the numbers required by the Forces.

38. It is the aim of His Majesty's Government that the highest possible proportion of its peace-time defence commitments (*i.e.* those which require the employment of Forces on whole-time service) should be met by regular Forces. In pursuance of this aim it is their intention to do everything in their power to stimulate recruitment for the regular Forces and the re-entry of time-expired men. It is their earnest hope that as time proceeds a combination of improved recruitment and re-engagement with diminished defence commitments will enable their aim to be realised. For the present, however, a large gap exists which can only be filled by the National Service man. The need for National Service as a means of training reserves remains as described in the Statement Relating to Defence, 1948 (para. 61).

RECRUITMENT FOR THE REGULAR FORCES

39. The post-war level of regular recruitment compares favourably with the pre-war figures. In 1948, 19,700 regular other ranks were accepted for the Navy, 34,200 for the Army, and 13,600 for the Air Force. But in view of His Majesty's Government's desire that the highest possible proportion of the day-to-day commitments should be met with regular Forces, a greatly increased flow is necessary.

40. Much thought has, therefore, been given to methods of stimulating regular recruitment and re-engagement. Service in the Armed Forces is a direct and important contribution to the security of our country and His Majesty's Government believe that on these grounds alone it will always possess a strong attraction for many. They intend that this attraction should be reinforced by conditions of service which are such as to make a wide appeal and to compete on reasonably equal terms with employment in civil life.

PAY AND CONDITIONS OF SERVICE

41. In pursuance of this policy His Majesty's Government have considered the question of pay in the Forces. From November 24, 1948, increases in pay were granted to regular other ranks and increases in marriage allowances to regular officers and other ranks.

42. In fixing these new rates weight continued to be given to the disadvantageous features of life in the Forces, such as frequent changes of station and separation from families. There are, on the other hand, many favourable features which must not be forgotten. Service pensions and gratuities, which are non-contributory, the generous allowance of paid leave in the Forces, the opportunities for promotion and the fact that, in addition to his pay, the Serviceman is fed, clothed, and accommodated by the Services (or receives cash allowances in lieu), must all be taken into account.

43. One of the handicaps to an improvement in recruiting is uncertainty about resettlement in civil life after discharge. Close contact has been maintained between the Service Departments and the Ministry of Labour

in regard to this important problem and during the past year plans have been made which should go far, certainly further than at any time in the past, to alleviate it. For example, a comprehensive scheme for providing openings for ex-regulars is being worked out with industry, with the support of the Minister of Labour's National Joint Advisory Council. The need for special training for civil employment either within industry or in establishments set up by the Ministry of Labour will be considered as part of that scheme. In Government service a proportion of vacancies for the clerical and executive classes will, in future, be reserved for competition among ex-regulars. The Trade Unions have already agreed that men trained in a wide range of Service trades should be recognised as qualified for membership as skilled men, and discussions are proceeding with a view to recognising the status of other Service tradesmen. There will also be schemes of training to assist selected candidates who wish to enter business. These comprehensive arrangements will, it is hoped, greatly enhance the attractiveness of the Services to the right type of regular recruit.

USE OF MAN-POWER IN THE SERVICES

44. Quite apart from their conditions of service members of the Forces rightly want to be satisfied that they are doing a worth-while job and are not wasting their time. In the upheaval and dislocation arising from the turnover of man-power referred to in para. 32, there was almost inevitably some waste of man-power, and this has given rise to some legitimate criticisms. A concentrated effort is being made to secure a progressive improvement in this regard, since His Majesty's Government believe that the proper and economical use of man-power—the military equivalent of higher productivity—is a matter of crucial importance. The Service Ministers will accordingly continue to give the subject their unremitting attention until a satisfactory position is reached.

RESERVE AND AUXILIARY FORCES

45. Apart from their regular reservists the Services could, as stated in para. 33, at present rely on large reserves consisting of trained men and women who served in the recent war. The value of these reserves will, however, gradually decline. National Service will in time provide reserves in considerable numbers, but these in no way supersede the need for voluntary Reserve and Auxiliary Forces. The training obligations imposed on National Service reservists are not of themselves sufficient to produce, for example, a fully operational member of aircrew, a highly skilled tradesman, or an experienced non-commissioned officer. For such purposes additional training is needed which can only be given on a voluntary basis in the Reserve and Auxiliary Forces. The success of the current campaign to build up these Forces is therefore of the utmost importance. The series of broadcasts by the Prime Minister and other leading members of the Government and the Opposition should leave no doubt on this score: they have made it clear that recruitment to the Reserve and Auxiliary Forces, as well as to the regular Forces, is a vital national need. The gratitude of the nation is due to many thousands of men and women who have joined the voluntary Reserve and Auxiliary Forces over the past

months. Nevertheless, as the following figures show, many more are needed to complete the ranks of these voluntary Forces:

	Strength October 1	Strength January 1	Target
Royal Naval Volunteer Reserve	2,747	3,241	7,000
Royal Marine Forces Volunteer Reserve ..	—	199	700
Territorial Army and Women's Royal Army Corps (Territorial Army)	55,306	67,210	150,000
Royal Auxiliary Air Force	2,494	3,509	29,000
Royal Air Force Volunteer Reserve ..	2,806	4,459	38,000

WOMEN'S SERVICES

46. His Majesty's Government have also given their attention to providing openings for women in the Forces. The Auxiliary Territorial Service and the Women's Auxiliary Air Force, which were founded on an auxiliary basis in 1938 and 1939 respectively, have been reconstituted as a permanent part of the regular Army and Air Force with similar career prospects and a similar disciplinary code. The new Forces, the Women's Royal Army Corps and the Women's Royal Air Force, came into existence on February 1, 1949, under the Army and Air Force (Women's Services) Act passed in April, 1948. Similarly, the two Nursing Services will become permanent parts of the Army and the Royal Air Force. The Women's Royal Naval Service has also become a permanent and integral part of the naval service under its own code of discipline. New and generally much improved rates of pay for the W.R.N.S., the W.R.A.C. and the W.R.A.F. were also introduced in November, 1948, together with a scheme of retired pay, Service pensions and long-service gratuities.

CIVILIAN MAN-POWER

47. A conspectus of the civilian man-power employed by the Service Departments, the Ministry of Supply and the Ministry of Defence is included in the table at Annex I. The downwards trend in the number of civilians directly employed in 1948-49, foreshadowed in Cmd. 7327, was reversed in the latter part of the financial year owing to the emergency measures put in hand in the autumn of 1948: the number of these civilians which is estimated to be 30,000 in excess of the corresponding figure for April 1, 1949, given in Cmd. 7327, is expected to remain fairly constant during the year 1949-50. The expanded production programme will, however, need additional industrial man-power, and this is reflected in the figures of 450,000 for production, research, and development, etc., in Annex. I.

VI.—EQUIPMENT

PRODUCTION PROGRAMME 1949-50

48. The 1949-50 production programme represents the minimum necessary to cover the maintenance requirements of the year after the fullest use of remaining war stocks; to provide for the build up or overhaul of some of the more essential emergency reserves in continuation of the

steps authorised in September, 1948; and to allow for a modest instalment of modernisation.

49. The Naval programme provides mainly for the maintenance requirements of the Active Fleet and for some progress in refitting ships of the Reserve Fleet. Only a token provision is made for new construction apart from the continuation of programmes outstanding from former years. Additional aircraft will be provided and the development of new types will be continued.

50. The bulk of the funds available to the Army will be used to meet ordinary maintenance requirements and reserve deficiencies, and for the overhaul or modernisation of existing equipment. Nearly £14½ million will be spent on the vehicle overhaul programme alone. Among the more important items included in the Army re-equipment programme are tanks, radar, and radio; in the field of air defence, provision is made for the modernisation of certain types of specialist equipment and the replenishment of reserves.

51. The Royal Air Force programme continues, at an increasing rate, the re-equipment of the fighter squadrons with the latest type of jet aircraft and provides for the gradual replacement of transport and training aircraft by modern British types. In addition, the reconditioning of war-time stocks of fighter aircraft, undertaken as one of the precautionary measures, will continue. Re-equipment will extend to certain major items in the field of tele-communications and radar. A considerable vehicle repair programme will continue.

52. Besides meeting the requirements of the Services, industry in the United Kingdom supplies warlike equipment and stores to other parts of the Commonwealth and to friendly foreign countries.

WAR POTENTIAL

53. To safeguard our industrial war potential we have retained as much as possible of the specialised capacity and equipment called into being during the war. The Admiralty has a strong nucleus in the Royal Dockyards, and the private shipyards and the marine engineering industry can also be readily adapted for the production of warships. In the aircraft industry the specialised nucleus of firms which design airframes and aero-engines and would lead and train newcomers if we had to mobilise industry for war has been maintained. The Ministry of Supply has stored considerable quantities of plant for making light alloy forgings and extrusions, the lack of which retarded the expansion of the aircraft programme in the years before the war.

54. In the munitions field, the Ministry of Supply has been able to keep in production a considerable number of Royal Ordnance Factories, with the aid of a measure of civil work undertaken without detriment to war potential. They have also stored large quantities of specialised plant, machine tools, jigs, and gauges, as well as ammunition components, explosives, and propellants which would meet the needs of the filling factories in the early period of a war.

55. Plans for the transition from peace to war production are being prepared and a start has been made on the compilation of a register of industrial capacity earmarked for specific purposes.

DISPOSAL OF STORES

56. It would have been unjustifiable, even if it had been physically possible, for the Services to keep the colossal quantities of equipment which they held in all parts of the world at the end of the war. This equipment was often stored in conditions which were satisfactory when the turnover was rapid but useless if the goods had to be housed for several years. The storage and maintenance problems were increased as equipment was handed in on demobilisation and the depot staffs became smaller and smaller. Much of the storage in this country and in some Commands overseas was in requisitioned buildings urgently needed for civil purposes. The need for wholesale and rapid disposal was fully appreciated by the Coalition Government, who laid down in 1944 a policy subsequently endorsed by the present Government. It was to dispose only of items surplus to the post-war equipment and reserve requirements of the Services. No exceptions to this rule have been made except where disposal was the only alternative to abandonment or rapid deterioration, or where particular items were urgently wanted for civilian use, or for the export drive. Some goods have been sold, other have been disposed of to Commonwealth Governments or friendly foreign Powers. Large stocks were left behind in India and Burma by arrangement with the Governments of those countries. Stocks have also been drawn upon continuously and extensively to meet the current maintenance needs of the Forces in the period since the war, and to help Greece in her struggle against aggression.

VII.—RESEARCH AND DEVELOPMENT

57. His Majesty's Government regard progress in research and development as a matter of supreme importance. Supervision and co-ordination of the programmes is the responsibility of the Defence Research Policy Committee which, under the chairmanship of Sir Henry Tizard, advises the Minister of Defence and the Chiefs of Staff on matters connected with the formulation of scientific policy in the defence field, and is responsible for presenting to the Minister of Defence an annual unified review of future defence research and development policy. The Controller of the Navy and the two Controllers of Supplies in the Ministry of Supply (responsible for munitions and aircraft production) are now members both of the Defence Research Policy Committee and of the Joint War Production Staff, which ensures a close co-operation between these two bodies. The position of Sir Henry Tizard, who is also Chairman of the Advisory Council on Scientific Policy, ensures a personal link with research on the civil side. The Defence Research Policy Committee is served by a permanent staff.

58. Little can be said about progress in research and development as for the most part it must remain secret. Among the projects which may be mentioned are improvements in radar for the location of targets and for fire control; improvements in anti-aircraft fire control; and developments in equipment for the detection, location, and destruction of submarines. Notable advances have been made in turbo-jet and turbo-propeller aero-engines and in the design of aircraft, and we have extended our knowledge about flight through the trans-sonic zone and

into supersonic speeds. A big increase has been achieved in the rate of fire of certain guns and improvements have been made in bridging equipment representing an important advance on the Bailey bridge. Research and development directed to the production of unconventional weapons is proceeding on high priority and such weapons will be brought into service as and when they are ready. Meanwhile, the Services must be ready, if need be, to fight with the weapons of to-day.

VIII.—THE WORKS PROGRAMME

59. The works programme is of necessity influenced by the capital investment programme in the United Kingdom and balance of payment considerations abroad. Excluding war terminal charges, the effective net provision for works and lands is, however, slightly higher than that in 1948–49.

60. Withdrawal of stores from Palestine and other theatres made it necessary to spend large sums in 1948–49 on the building of new storage accommodation. A substantial reduction in the provision for this item in 1949–50 makes it possible to increase the allocations for other works programmes.

61. In view of the importance attached by His Majesty's Government to the improvement of living conditions of the Forces there will be an increase in the provision for married quarters and the present substantial outlay on improving barracks will be maintained, while further increases in the provision for improving the standard of housing will continue to be made as rapidly as circumstances permit. In 1948 the Services completed 1,258 married quarters at home and 652 abroad. They plan to complete 2,726 and 1,935 respectively in 1949. Quarters have also been provided in 1948 by conversion of existing buildings and hutments and this will be continued in 1949.

62. The purchase of land and the construction of many drill halls, quarters for permanent staff and other works are essential if the Territorial Army is to be ready to receive the flow of National Service men leaving the Forces from July 1, 1950, onwards. His Majesty's Government intend to ensure the timely completion of this programme on which a start has already been made. The provision for Territorial Army works and lands has accordingly been doubled.

IX.—COMMON ADMINISTRATIVE POLICY IN THE SERVICES

63. After the recent war, and largely because of the developments during the war years, the complete amalgamation of certain of the major common administrative services of the Forces was advocated in many quarters. His Majesty's Government, while not excluding the possibility of eventual amalgamation of certain services, concluded that immediate amalgamation was undesirable.

64. The Statement Relating to Defence 1948 stated (paragraph 47) that Co-ordination Committees had been established for the medical, educational, and chaplaincy services. The Medical Committee, on which the Ministry of Health is represented, was first in the field and proposals

covering many important aspects of medical administration have already been considered by the Committee of Service Ministers, to whom these Co-ordination Committees report. Among the recommendations of this Committee to which effect has been given are a number dealing with the working relationship between the medical services of the Forces and the National Health Service, designed to avoid overlapping of functions between those services. In the major Commands overseas, similar committees have been set up by the Service Departments to secure the greatest measure of local co-ordination of the medical services, not only of the Forces themselves but also with any Government medical service in the territory concerned. Useful work has also been done by the Educational and Chaplaincy Committees. The Chaplaincy Committee is concerned mainly with the administrative aspect of the work of the Service chaplains. There is already a large measure of co-operation on a denominational basis between the chaplains of the three Services at home and overseas and this process is being fostered in every way.

65. Apart from this specific machinery for inter-Service co-ordination in the administrative field, the Ministry of Defence, as one of the main responsibilities with which it was charged, provides a focal point for inter Service consultation and for resolving those matters in which common administrative practice is desirable. The work of the Ministry in this field is constantly increasing. Implementation in each of the Armed Forces of policy decided upon by the Cabinet, or by the Minister of Defence and the Service Ministers in consultation, remains the responsibility of the Service Ministers.

ANNEX I

MAN-POWER CEILINGS FOR ADMIRALTY, WAR OFFICE, AIR MINISTRY, MINISTRY OF SUPPLY,
AND MINISTRY OF DEFENCE

(United Kingdom only) (Thousands)

	April 1, 1949						March 31, 1950					
	Adm.	W.O.	Air	Supply	Defence	Total	Adm.	W.O.	Air	Supply	Defence	Total
(1) Uniformed	145	416	232	—	—	793	146	391	213	—	—	750
(2) Civilians— (a) directly employed non-industrials, including those engaged on production, research and development, and works	33·8	37·8	26·4	22	0·8	120·8	30·5	36·3	25·9	22	0·8	115·5
(b) industrials (other than on production, etc.) ..	28	69·8	31·5	6	—	135·3	29	69·3	32·5	6	—	136·8
Total Civilians	61·8	107·6	57·9	28	0·8	256·1	59·5	105·6	58·4	28	0·8	252·3
Combined Ceiling	206·8	523·6	289·9	28	0·8	1,049·1	205·5	496·6	271·4	28	0·8	1,002·3

(3) Estimate of the average numbers engaged on production, research and development, works, and N.A.A.F.I. throughout the year excluding the directly employed non-industrials but including directly employed industrials 450

NOTES

(Item 1.)—Uniformed personnel serving in the Ministry of Supply and Ministry of Defence are attributed to their parent Service Department.
(Item 3.)—All directly employed non-industrial staffs, however employed, are included under Item 2.

ANNEX II

DIVISION OF THE DEFENCE BUDGET UNDER THE PRINCIPAL HEADINGS
(£ millions)

1	2 Admiralty			3 War Office			4 Air Ministry			5 Ministry of Supply			6 Ministry of Defence			7 Totals		
	Gross	A. in A.	Net	Gross	A. in A.	Net	Gross	A. in A.	Net	Gross	A. in A.	Net	Gross	A. in A.	Net	Gross	A. in A.	Net
1. Pay, etc., of Service personnel	38.96	0.28	38.68	103.35	9.1	94.25	56.95	1.75	55.2	2	—	2	0.2	—	0.2	201.46	11.13	190.33
2. Pay, etc., of Reserve, Territorial, and Auxiliary Forces, and grants for administration, etc. ..	1	—	1	7.49	0.11	7.38	1.18	—	1.18	—	—	—	—	—	—	9.67	0.11	9.56
3. Pay, etc., for civilians ..	34.87	0.43	34.44	50.36	1.56	48.8	24.07	0.22	23.85	7.7	—	7.7	0.42	—	0.42	117.42	2.21	115.21
4. Movements	6.72	0.02	6.7	23	0.35	22.65	9.28	0.66	8.62	1.6	—	1.6	0.05	—	0.05	40.65	1.03	39.62
5. Supplies— (a) Petrol oil, and lubricants and (b) Food and ration allowance (c) Fuel and light (d) Miscellaneous	9.29 9.27 3.52 0.69	2.4 1.84 0.87 0.17	6.89 7.43 3.45 0.52	8.25 32.1 4.4 1.9	2.2 9.62 0.92 0.1	6.05 22.48 3.48 1.8	14.75 10.76 3.34 0.53	2 0.75 0.57 0.02	12.75 10.01 2.77 0.51	— — — —	— — — —	— — — —	— 52.13 11.26 3.12	— 12.21 9.7 0.29	— 39.22 9.7 23.83	25.69 39.22 9.7 23.83		
Production and research •	22.77	4.48	18.29	46.65	12.84	33.81	29.38	3.34	26.04	—	—	—	—	—	—	98.8	20.66	78.14
Works and Lands— (a) Works (b) Rent, purchase, etc. ..	75.27 9.51 2.05	12.6 0.65 }	62.67 10.91 }	69.25 {26.33 7.65	19.25 } 5.3 }	50 28.68 {23.15 3.67	82.5 }	18 4.2 }	64.5 22.62 }	38.15 8.2 0.1	— — —	38.15 8.2 0.1	— — —	— — —	— — —	265.17 67.19 13.47	49.85 10.15 }	215.32 70.51 }
8. Miscellaneous effective services	11.56	0.65	10.91	33.98	5.3	28.68	26.82	4.2	22.62	8.3	—	8.3	—	—	—	80.66	10.15	70.51
9. Non-effective charges ..	3.16	1.21	1.95	6.37	2.94	3.43	3.34	1	2.34	—	—	—	0.04	—	0.04	12.91	5.15	7.76
0. Totals	209.01	19.76	189.25	356.2	51.5	304.7	236.69	29.24	207.45	57.75	—	57.75	0.71	—	0.71	860.36	100.5	759.86

• Includes the cost of development work undertaken by industry under contract, and the purchase of stores and equipment for research and development establishments.

SUPPLEMENTARY ESTIMATE, 1948-49:
NAVY, £15,500,000

EXPLANATION

The decision of H.M. Government, announced to Parliamentary in September, 1948, to take measures to strengthen the Defence Forces necessitated the speeding up of the Navy programme for re-fitting ships of the Reserve Fleet together with action to improve the position with regard to equipment and stocks generally. In addition, various commitments in respect of increases of pay and allowances to naval and civil personnel and other unforeseen liabilities have had to be accepted during the financial year. As a result, expenditure will unavoidably exceed the Parliamentary Grants and approval is now sought for an additional grant to make good the deficiency, the main causes of which are explained below.

A further sum of about £12,500,000 is required for work on refitting ships in reserve, partly in the Royal dockyards and partly by contract, on the repair, overhaul, etc., of aircraft, guns, and other equipment, and on the replenishment of essential stocks; to allow for greater progress made on current contracts; and to provide for the maintenance of civilian numbers at a higher level than was allowed for in the Estimates, partly on account of the accelerated programme of work and partly to release naval ratings for service at sea.

A further sum of about £6,300,000 is required to meet charges which could not be foreseen when the Estimates were prepared but which cannot be avoided, *e.g.* increases in pay and allowances of naval personnel (£2,100,000), increases in pay and improved conditions of employment for civil industrial staff (£2,600,000), revision of scales for salaried staff (£600,000) and increases in prices (£1,000,000).

A further sum of about £5,200,000 is required, allowing for underspendings on some services, to meet various liabilities which were underestimated or unforeseen when the Estimates were prepared: for naval pay, etc., because of higher average rates and greater numbers in receipt of marriage allowance (£1,200,000); for liabilities unavoidably carried over from 1947-48 (£1,100,000); for miscellaneous production services (£600,000); for travelling, etc., expenses (£400,000); for war terminal charges, owing to more rapid clearance of claims for re-instatement of requisitioned property and of contract settlements (£1,500,000); for other effective and non-effective purposes (£400,000).

H.M. Government propose to set up at an early date a National Institute of Oceanography. The Institute will be administered by a Council under the Chairmanship of an Admiralty Minister and the First Lord of the Admiralty will answer to Parliament for its general work. The administrative details are now being worked out and provision for a Grant in Aid towards the first year's expenses is being made in the Navy's Estimates for 1949-50. The work of the Institute will require two small vessels and the Admiralty wish to buy two vessels, particularly suitable for the purpose, from the Falkland Islands Dependencies Government at a cost of £65,000, for which provision is sought under Vote 6, Subhead P in the Supple-

SUPPLEMENTARY ESTIMATE, 1948-49: NAVY 191

mentary Estimate now presented. The vessels will be transferred to the Institute in due course.

Against the foregoing liabilities which total £24,000,000 fall to be set additional Appropriations in Aid amounting to about £8,500,000 mainly from sales and ships and aircraft to Commonwealth and Foreign Governments and recoveries from contractors and others in respect of transactions relating to former years.

The net additional sum which Parliament is now asked to grant is thus £15,500,000.

JOHN DUGDALE } Secretaries
J. G. LANG }

ADMIRALTY,
February 8, 1949

1948-49

STATEMENT showing the further sums required under the several Votes concerned and the revised total of the Estimates for the year.

	Original Estimate	Supplementary Estimate now proposed		Revised Estimate
		Gross Expenditure (+ more or — less)	Appropriations in Aid (+ more or — less)	
1. Net Estimate ..	£33,738,000	+ £2,860,000	£—	£36,598,000
2. " " ..	9,663,000	+ 1,070,000	— 700,000	11,433,000
3. " " ..	1,463,000	+ 80,000	—	1,543,000
4. " " ..	4,357,000	+ 1,350,000	—	5,707,000
5. " " ..	621,000	+ 45,000	—	666,000
6. " " ..	6,892,000	— 35,000	+ 100,000	6,757,000
7. " " ..	646,000	+ 70,000	—	716,000
8 I. " " ..	22,784,000	+ 2,580,000	+ 280,000	25,084,000
8 II. " " ..	13,063,000	+ 6,100,000	+ 4,400,000	14,763,000
8 III. " " ..	20,484,000	+ 4,600,000	+ 1,900,000	23,184,000
9. " " ..	7,683,000	+ 2,600,000	+ 1,500,000	8,783,000
10. " " ..	7,638,000	+ 1,300,000	+ 320,000	8,618,000
11. " " ..	5,057,000	+ 820,000	+ 440,000	5,437,000
12. " " ..	4,624,000	+ 410,000	—	5,034,000
13. " " ..	14,023,000	+ 150,000	—	14,173,000
14. " " ..	264,000	—	+ 260,000	4,000
Total Navy Estimates:				
Gross total ...	173,250,000	+ 24,000,000	—	197,250,000
Appropriations in Aid	20,250,000	—	+ 8,500,000	28,750,000
Net total ..	£153,000,000	£15,500,000		£168,500,000

ABSTRACT OF NAVY

Vote	Service	ESTIMATES, 1949-50		
A	Maximum number of officers, seamen, boys, and Royal Marines, and members of the Women's Royal Naval Service, and the Naval Nursing Service	<i>Maximum Numbers</i>		
	Maximum number of Royal Marine Police	153,000		
		1,400		
		Gross Estimate	Appropriations in Aid	Net Estimate
		£	£	£
1	Pay, etc., of the Royal Navy and Royal Marines	37,510,000	285,000	37,225,000
2	Victualling and clothing for the Navy	15,250,000	3,560,000	11,690,000
3	Medical establishments and services	1,606,000	56,000	1,550,00
4	Civilians employed on Fleet services	5,835,000	20,000	5,815,000
5	Educational services	800,000	105,000	695,000
6	Scientific services	7,594,000	414,000	7,180,000
7	Royal Naval Reserves	1,000,100	100	1,000,000
8	Shipbuilding, repairs, maintenance, etc.			
	Section I.—Personnel ..	26,100,000	200,000	25,900,000
	Section II.—Matériel ..	28,290,000	8,070,000	20,220,000
	Section III.—Contract work	31,180,000	2,630,000	28,550,000
9	Naval armaments	14,775,000	1,740,000	13,035,000
10	Works, buildings, and repairs at home and abroad	10,916,000	650,000	10,266,000
11	Miscellaneous effective services ..	8,244,900	1,886,900	6,358,000
12	Admiralty Office	5,111,000	5,000	5,106,000
13	Non-effective services	14,695,000	82,000	14,613,000
14	Merchant shipbuilding, etc. ..	103,000	56,000	47,000
	Total	£ 209,010,000	19,760,000	189,250,000

(a) Exclusive of Supplementary Estimate of £15,500,000 (H.C. 66/1 948-49).

Admiralty } HALL
February 8, 1949 } FRASER OF NORTH CAPE

CECIL HARCOURT
C. S. DANIEL

ESTIMATES, 1949-50

Estimates, 1948-49 (a)			Difference on Net Estimates		Vote
<i>Maximum Numbers</i>			<i>Decrease</i>		A
167,300			14,300		
1,592			192		
Gross Estimate	Appropriations in Aid	Net Estimate	Increase	Decrease	
£	£	£	£	£	
33,888,000	150,000	33,738,000	3,487,000	—	1
13,701,000	4,038,000	9,663,000	2,027,000	—	2
1,500,000	37,000	1,463,000	87,000	—	3
4,507,000	150,000	4,357,000	1,458,000	—	4
714,300	93,300	621,000	74,000	—	5
7,239,000	347,000	6,892,000	288,000	—	6
646,100	100	646,000	354,000	—	7
					8
23,305,000	521,000	22,784,000	3,116,000	—	Sec. I
21,368,000	8,305,000	13,063,000	7,157,000	—	Sec. II
23,404,000	2,920,000	20,484,000	8,066,000	—	Sec. III
8,862,000	1,179,000	7,683,000	5,352,000	—	9
8,138,000	500,000	7,638,000	2,628,000	—	10
6,991,300	1,934,300	5,057,000	1,301,000	—	11
4,635,000	11,000	4,624,000	482,000	—	12
14,047,300	24,300	14,023,000	590,000	—	13
304,000	40,000	264,000	—	217,000	14
173,250,000	20,250,000	(a) 153,000,000	36,467,000	217,000	
Net increase			£36,250,000		

H. A. PACKER
G. E. CREASY

J. H. EDELSTEN
RALPH EDWARDS

JOHN DUGDALE
W. J. EDWARDS
J. G. LANG

STATEMENT OF THE
FIRST LORD OF THE ADMIRALTY EXPLANATORY
OF THE NAVY ESTIMATES, 1949-50

(Cmd. 7632)

THE NAVY ESTIMATES 1949-50

INTRODUCTORY

The provision proposed for the Naval Service in the financial year 1949-50 is £189,250,000, which is £36,250,000 more than the sum voted by Parliament for the preceding financial year. About one-half of the increase arises from additional liability of an inevitable nature, chiefly improvements in naval and civilian emoluments, exhaustion of war stocks, and higher prices. The remainder represents additional provision for measures required to maintain and improve the state of readiness of the Fleet in accordance with the policy announced to Parliament in September last, in particular, for the refitting of ships in reserve, for the replacement of worn out and obsolescent equipment and for the replenishment of essential stocks.

It is mainly for these reasons that the extra expenditure reflected in the supplementary grant of £15,500,000, for which I am concurrently asking, has been incurred in 1948-49.

Vote A provides for a maximum bearing of 153,000 for the Royal Navy, Royal Marines, and ancillary services, together with 1,400 Royal Marine Police. The figure of 153,000 includes 7,200 for the Women's Royal Naval Service and 300 for the Queen Alexandra's Royal Naval Nursing Service. It also includes at the maximum approximately 5,000 men and women on release leave, and some 3,000 local entrants abroad. The effective demand on United Kingdom man-power for uniformed personnel will be about 145,000, at the beginning, and 146,000 at the end, of the financial year and somewhat lower in the middle of the year, when the larger entries of National Service men made in the early part of 1947, and the first of the men on extended service engagements have been released.

In the latter part of 1947-48 the personnel of the Fleet was heavily reduced and it was necessary to immobilise certain ships for a time. The crews of these vessels have now been completed and the build-up of the active Fleet has proceeded satisfactorily according to plan. Particulars are given on page 180. It will, however, take time to eliminate all lack of balance in the naval man-power of the Fleet. The decision taken by the Government last September to retain National Service men for a further three months has improved the position so far as numbers of trained men are concerned, but no administrative action can quickly make good the deficiencies arising from the heavy loss of experienced men during the last few years and the very small intake of men on regular engagements during the war years.

I do not propose this year to undertake any substantial programme of New Construction. The provision in the Estimates under this head (£10,880,000 for 1949-50 compared with £8,987,000 for 1948-49) is

almost entirely in respect of the continuation of programmes outstanding from former years, and for further new construction in 1949-50 no more than token provision is made.

Policy during the forthcoming year will be directed to the improvement by all possible means of the state of readiness of the Fleet; to the welding of the new Royal Navy, that has now emerged, into an effective fighting instrument; and also to vigorous research and development on which the maintenance of the traditional efficiency of the Royal Navy, particularly in the years ahead, will so largely depend.

HALL

NOTES ON MATTERS OF GENERAL INTEREST

NAVAL ACTIVITIES DURING THE YEAR

GERMANY

The strength of the naval element of the British Forces of Occupation in Germany has been reduced to about 180. While this figure may continue to drop gradually, the need for naval representation at various levels in the counsels of the occupying powers is likely to remain for an indefinite period.

The principal tasks connected with demilitarisation in which the Navy is interested have been the plan for the partial demolition of naval works at Wilhelmshaven, and the destruction of the essentially war-like parts of the former torpedo works and testing station at Eckernförde. The former has made satisfactory progress, and the latter will be completed very shortly.

JAPAN

All units of the Japanese Fleet allotted to the United Kingdom have been or are being scrapped, with the exception of two ships which are being disposed of within the Commonwealth. The Naval Port Party at Kure has been withdrawn.

MIDDLE EAST AND FAR EAST

The activities of the Royal Navy in support of the policy of H.M. Government in Palestine continued until the evacuation of British Forces from Palestine. The Royal Marine Commando Brigade played a prominent part in the latter stages of the occupation and the final withdrawal was covered by aircraft from H.M.S. Ocean.

Naval units have been maintained at or near Aqaba, and the movement of British Forces to Aqaba at the end of 1948 was assisted by the Royal Navy.

British warships have played an active part in the coastal operations against terrorists and bandits in Malaya, and the forces under the Commander-in-Chief Far East Station, have been at hand to undertake any tasks which might be given them for the safety of British lives and interests in China and Hongkong.

British naval advice has assisted the Burmese Government to make the best use of their Navy.

THE HOME FLEET'S CRUISES

At the end of 1948 the Home Fleet carried out a cruise to the West Indies, with the objects of restoring the normal activity and efficiency of the Fleet and of visiting British possessions and the United States. During the cruise the Commander-in-Chief, flying his flag in H.M.S. Duke of York, visited Norfolk, Virginia, and the aircraft carriers and four destroyers visited South Africa. The remainder of the Fleet visited British Honduras and a large number of islands in the West Indies. The Fleet was received with great enthusiasm by the people of the West Indies and South Africa.

On the return of the Fleet to this country large-scale exercises were carried out, in the final stages of which the Army and the R.A.F. took part.

The spring cruise of the Home Fleet this year is taking the ships to Gibraltar, and combined exercises will be carried out with the Mediterranean Fleet. The Home Fleet ships on this cruise, which started on January 31, are the battleship Duke of York wearing the flag of the Commander-in-Chief, the light fleet carrier Theseus, the 2nd Cruiser Squadron, destroyers of the 4th and 5th Flotillas, and two submarines. This force will be strengthened early in March by the fleet carrier Implacable and two destroyers. H.M.S. Theseus and one destroyer will visit Malta. After the combined exercises ships will pay short visits to Portuguese ports before returning to their home bases, in order to give Easter leave.

THE ANTARCTIC

During the early months of 1948, H.M. frigate Snipe was placed at the disposal of the Governor of the Falkland Islands for visits to the Dependencies in support of British interests in this area. She was later joined by the cruiser H.M.S. Nigeria.

H.M. frigate Sparrow has spent a considerable part of the 1948-49 season in the Falkland Islands Dependencies. H.M.S. Glasgow, with the Governor and the Commander-in-Chief on board, visited South Georgia in February, 1949.

Under a diplomatic arrangement which was made public in January, 1949, the Governments of the United Kingdom, Argentina, and Chile declared that they foresaw no need to send warships south of latitude 60° South during the Antarctic summer of 1948-49, otherwise than in repetition of normal routine movements which have become customary in recent years.

ALBANIA

The claim by H.M. Government against the Government of Albania, arising from the mining of H.M. destroyers Saumarez and Volage in the Corfu Channel in October, 1946, was heard by the International Court of Justice during the course of the year. The judgment of the Court has not yet been given.

ITALY AND U.S.S.R.

Under the terms of the Treaty of Peace with Italy, one battleship, one 6-inch cruiser, three destroyers, three torpedo boats, two submarines, and

some minor warships and auxiliaries of the Italian Navy were allotted for transfer to the U.S.S.R.

It was agreed last year in the Four Power Naval Commission at Rome that the transfer of these vessels should be simultaneous with the return to the United Kingdom of the following warships lent to Russia during the war:

- 1 Battleship (Royal Sovereign).
- 7 Destroyers (Roxborough, St. Albans, Brighton, Richmond, Chelsea, Leamington, and Georgetown); and
- 3 Submarines (Unbroken, Unison, and Ursula).

The two battleships were included in the first group of ships to be transferred, Royal Sovereign and Giulio Cesare arriving at Rosyth and Valona respectively within 24 hours of each other, during the first week in February. Other groups of ships are due to be handed over in March and July, 1949.

NEW CONSTRUCTION AND REPAIR WORK FOR THE NAVY

It is still necessary to proceed slowly with naval new construction, and vessels of earlier programmes are being progressed so far as circumstances permit or it is desirable to do so. Particulars are given in the Navy Estimates 1949-50 on pages 192 *et seq.* Commercial shipyards have continued to be engaged almost entirely on merchant ship work, for home and export customers.

The following warships were completed during the financial year:

Light Fleet Carriers	..	Magnificent—transferred to the Royal Canadian Navy on loan. Terrible—transferred to the Royal Australian Navy and renamed H.M.A.S. Sydney.
Destroyers	.. ..	Alamein. Broadsword.
Frigate	.. ..	Morecambe Bay.
Surveying Ships	.. ..	Dampier. Dalrymple.
Motor Gun Boat	..	No. 538.
Deep Diving Vessel	..	Reclaim.

In August, 1948, it was decided to refit an additional number of mine sweepers, destroyers, and other ships of the Reserve Fleet in order to reduce the considerable arrears of repair work: some of these refits were put out to contract in private yards. In accordance with the decision, repairs are to be made to other Reserve Fleet ships in 1949-50. This work, which will proceed concurrently with necessary repairs to ships of the active fleet, will entail continuation during the forthcoming financial year of naval repair work in the private shipyards to the extent that the programme exceeds the capacity of the Royal Dockyards. In present circumstances the need for the Royal Dockyards to undertake commercial work is diminishing.

The work of installing dehumidification apparatus for preservation purposes in ships of the Reserve Fleet has been proceeding as rapidly as possible.

STRENGTH AND BUILD-UP OF THE FLEET

The build-up of the Fleet during 1948-49 was completed as forecast in the Explanatory Statement to the 1948-49 Estimates, and by September the Home Fleet had reached a sea-going strength of one battleship, two light fleet carriers, four cruisers, and two destroyer flotillas. H.M.S. Vanguard was also completed to full complement in preparation for the visit of Their Majesties to the Antipodes, which was later regretfully cancelled owing to the illness of His Majesty. H.M.S. Vanguard will remain in commission and will strengthen the Mediterranean Fleet.

The Fleets on the East Indies and America and West Indies Stations have been reinforced.

The following table shows the strength of the Fleet in classes (excluding vessels of the Fleet Train, attendant ships, and small craft, of which there are considerable numbers):

	Active Fleet	Training and experimental, etc. (special complements)	In Reserve or reducing to Reserve (not including ships for disposal)	In course of construction *
Battleships	Duke of York Vanguard	Anson King George V Howe (a)	—	—
Fleet Carriers	Implacable	Victorious Illustrious	Indefatigable Formidable Indomitable (a)	2
Light Fleet Carriers	Ocean Triumph Vengeance Theseus	Warrior Glory (a)	—	8
Escort Carriers	—	—	Campania	—
Cruisers	15	2	12	3
Destroyers	33	20	65 (b)	8
Frigates	25	19	129 (c)	1
Monitors	—	—	2	—
Submarines	30	4	31 (d)	—
Minesweepers	14	2	50	—
Fast Minelayers	—	—	3	—

* Work on some ships temporarily suspended. (For details see Navy Estimates 1949-50, pages 192 *et seq.*)

(a) Refitting.

(b) Includes 3 for transfer to Royal Indian Navy and 2 for transfer to Royal Pakistan Navy.

(c) Includes 2 for transfer to Royal New Zealand Navy.

(d) Includes 2 on loan to Royal Netherlands Navy.

DISPOSAL OF SHIPS OF THE ROYAL NAVY

During the year 1948-49, various Commonwealth Governments acquired ships from the Royal Navy for the development of their own Navies.

The transfer of the light fleet carrier H.M.S. Terrible to the Government of Australia and her commissioning as H.M.A.S. Sydney inaugurates naval aviation in Australia, and the plans of the Australian Government for further development extending over the next four or five years have been placed upon a secure footing.

The Royal Canadian Navy, after returning H.M.C.S. Warrior to the

Royal Navy, has taken into service as a replacement the light fleet carrier H.M.S. Magnificent.

The Government of New Zealand has acquired the first four of six "Loch" class frigates, which form a substantial addition to the Royal New Zealand Navy.

H.M.S. Achilles was handed over to the Union of India and the vessel re-commissioned as H.M.I.S. Delhi in July, 1948, becoming the first cruiser to fly the flag of the Royal Indian Navy.

Among the ships transferred to the Navies of our war-time allies the most important was the light fleet carrier H.M.S. Venerable, which has been accepted into service by the Royal Netherlands Navy under the name Karel Doorman. A tabular statement of H.M. Ships (destroyers and above) given or sold since August, 1945, or at present on loan, to Commonwealth and Foreign Governments is given below:

Ships	To Commonwealth Governments	To Foreign Governments	Total
Light Fleet Carriers	2	2	4
Cruisers	3*	1	4
Destroyers	7	22	29
Submarines	—	20	20

* One of the three cruisers shown in last year's statement as transferred to Commonwealth Governments was, in fact, transferred before August, 1945, H.M.S. Achilles has since been transferred to India.

NAVAL AVIATION

The past year has been a period of consolidation. Re-equipment of front-line and training squadrons with modern types of aircraft and equipment has steadily continued, and plans have been prepared for the modernisation of aircraft carriers and airfields to enable them to be used by the more advanced types of aircraft, which will be coming into operation in the future.

On commissioning the Third Aircraft Carrier Squadron joined the Home Fleet, and the Fleet's autumn cruise to the West Indies and South Africa provided welcome opportunities for newly formed crews to gain valuable experience in air operations at sea.

The system of flying training in the Navy and the methods of operating and maintaining aircraft both afloat and ashore are being kept under constant review and considerable improvements and economies, including an encouraging reduction in the aircraft accident rate, has been achieved.

RESEARCH AND DEVELOPMENT

The maintenance of our sea communications in any future war will depend in high degree on the ability of the Navy, in co-operation with the Royal Air Force, successfully to counter attacks by weapons of a familiar kind, but of greatly improved efficiency, and against weapons which have so far not been used at sea.

Rapid progress has been made in concentrating staff and facilities on those problems which, with the advice of the Defence Research Policy Committee, have been selected as being of the highest importance.

Close co-operation with the staffs of other Ministries engaged on related problems, with universities and civilian research organisations, and with industry continues to be maintained. The fullest use is made of civilian and industrial capacity whenever this is available.

A small force, representative of all branches of the Fleet, is conducting trials under cold-weather conditions to determine the effects of low temperatures on mechanical and electrical equipments, fuelling at sea, aircraft maintenance and performance, etc. Attention is also being devoted to the important problems of human welfare and efficiency. Civilian scientists and technicians have been embarked to conduct special investigations during the cruise.

Further valuable information has been obtained by the continued use of surplus warships as targets in a scientific investigation of the effects on ships' structures of underwater attack, gunfire, and air attack. These trials involve no loss of materials, as after each ship has served its purpose as a target it is handed over to shipbreakers for disposal as scrap.

During the year a cruise of considerable interest was conducted by H.M. Submarine Ambush in which use was made of the "snort" equipment which enables submarines to remain submerged for prolonged periods. During this cruise a survey was made of the effect of environment on the health and efficiency of the crew and particular attention was paid to a study of the effects of pressure variations on the ear, nose, and throat. The results showed that exposure to the conditions of "snorting" produces no permanent ill effects.

WORKS PROGRAMME FOR 1949-50

Provision has been made for progressing the construction of married quarters in full consultation with other departments and with local authorities.

Substantial improvement in the living conditions in the R.N. and R.M. Barracks is planned as a long-term project. Schemes to modernise the Marine Barracks at Deal and the Naval Barracks at Chatham, Portsmouth, and Plymouth have been prepared by consulting architects, and work will proceed during the year. Work has already started at Deal and Chatham.

It is proposed to commence work during the year on the construction of a submarine escape tank at Fort Blockhouse for the training of personnel.

The programme of reconstruction of runways at Naval Air Stations to meet the needs of modern aircraft has been started and will be continued in succeeding years.

It is hoped during the financial year to make substantial progress with the construction of research establishments already in hand and to start work on certain others.

The provision of up-to-date training and educational facilities will be undertaken within the limits of available resources. In this respect a major scheme is being put in hand for extending the facilities of the Engineering College at Manadon near Plymouth.

The re-planning of the Royal dockyards to modern standards continues with a view to their reconstruction and development. The scale on which work can proceed, is however, limited by the availability of money, men,

and materials, and it is clear that the programme can be undertaken on a long-term basis only.

Provision has been made for overtaking some of the heavy arrears of maintenance at H.M. Dockyards and other naval establishments which arose during the war.

HYDROGRAPHY AND METEOROLOGY

At the beginning of the financial year 1949-50 the R.N. Surveying Service will be operating with four ships and six launches in home waters and three ships in foreign waters. During the year one of the ships employed abroad will return to home waters and it is expected that two more conversions from ex-"Bay" class frigates will be commissioned for service abroad, thus bringing the strength of the Surveying Service at the end of the year up to five ships and six launches at home and four ships abroad.

Priority for work in home waters will again be given to the surveys of war-time wrecks which are being dispersed in the interests of safe navigation. Other surveys on the coasts of Great Britain are required for maintenance purposes in areas which are liable to constant change, and to bring up to date charts which are still based on work done in the last century and are no longer adequate for modern needs.

In foreign waters surveys will be carried out in waters which have become of strategic or economic importance and which in former years have never been methodically examined. Attention is being given to surveys of rivers in Borneo and Sarawak for opening up coal and timber resources.

Naval meteorological officers are appointed to naval establishments ashore and are carried afloat, as required. Arrangements exist on all naval stations for the broadcast of the routine messages containing the basic data needed by meteorological officers afloat. In this respect, as indeed in all other matters, the naval meteorological service works in close co-operation with the Air Ministry, Colonial Office, and meteorological services of the Commonwealth countries to ensure, in the common interest, that the most economical use is made of the resources available.

OCEANOGRAPHY

It was decided during 1948 to establish a chartered Oceanographical Research Council to administer a National Institute of Oceanography. The object of the Institute will be to advance the sciences of physical oceanography and marine biology: the Institute will also be charged with the duty of continuing part of the work hitherto done by the Discovery Committee, which is to be wound up at the end of the financial year, 1948-49. The funds of the Institute will be drawn partly from the Development Commission, partly from the Colonial Office Vote, and partly from subventions by other Commonwealth Governments. In view of the great importance of oceanographical research for naval purposes, the Admiralty will assume a considerable degree of responsibility for the work of the National Institute; the chairman of the Council will be an Admiralty Minister, and a sum of £50,000 has been set aside in this year's Navy Estimates towards the expenses of the Institute. Two research vessels will also be made over to the Institute by the Admiralty without charge.

PERSONNEL

REGULAR RECRUITING

The average rate of recruitment of men on regular engagements has been reasonably good. Owing to a continued high rate of wastage, however, total numbers did not increase so rapidly as had been hoped. Re-engagements also remained below the pre-war level.

During the year a new "Youth Entry" has been established to enable boys between the ages of $16\frac{1}{2}$ and $17\frac{1}{2}$ to enter the Navy—thus filling the gap between the boy entry and the normal adult entry. This scheme is proving very successful and a total of 1,000 will have been entered by March 31, 1949.

NATIONAL SERVICE

At the beginning of the financial year 1949–50, about 17,700 National Service men will be serving in the Royal Navy. About 4,000 of this total will be men entered early in 1947, who were retained for an additional period of three months, following the Government decision of September last. National Service men are now being entered at the rate of 10,000 a year, and it is expected this rate will continue throughout the financial year. Their initial period of shore training will, however, be shorter in order to avoid reductions in the number of the sea-going units of the Fleet.

RESERVES

Recruitment to the Royal Fleet Reserve has proceeded very satisfactorily, and provision is made in the Estimates for a maximum of 25,000. Provision has been made for 5,400 officers and men for the Royal Naval Reserve. It is hoped that recruitment for this reserve will shortly be re-opened.

Provision is also made for an increase in the strength of the R.N.V.R. to 7,000 and recruiting is proceeding accordingly. Provision is similarly made for the Royal Marine Forces Volunteer Reserve to attain a total strength of 700. No provision is necessary for the recently created Royal Naval and Royal Marine Emergency Reserves, since enrolment in these reserves does not involve either peace-time training, or payment of retainers, or bounties.

NAVAL PAY AND MARRIAGE ALLOWANCE

During the year, increases of pay have been announced for most categories of ratings, and there have been increases of marriage allowance for both officers and ratings.

The Women's Royal Naval Service has been established as a permanent part of the peace-time Navy and new permanent pay scales for both officers and ratings of the Women's Royal Naval Service have been introduced. Provision has accordingly been made in the Estimates for the additional expenditure involved.

NAVAL FLYING DUTIES

Last autumn it was decided that flying duties in naval aircraft should be performed by officers. As a result the scheme for entering ratings for pilot

duties has been terminated and a scheme for entering officers for short-service commissions (eight years) for pilot and observer duties has been introduced in its stead. A certain number of these officers will be allowed to transfer to the permanent list towards the end of their short-service commissions. These officers will be entered in the executive branch.

It is the Admiralty's intention to abolish the air branch of the Royal Navy and to transfer officers now serving in the air branch to the executive or engineering branches, as appropriate. Pilots and observers will be absorbed into the executive branch; air engineers will be transferred to the engineering branch which will be responsible for air engineering in addition to other duties. These measures are part of the process by which flying is being absorbed into the normal naval organisation—a process which at the same time ensures that an appreciation of the importance of aviation permeates throughout the Navy.

PRIZE ACT 1948

Early in the 1948–49 Legislative Session, a Prize Bill was passed by Parliament in order to create the conditions under which His Majesty might be pleased to exercise his traditional prerogative of making a grant, to those eligible in His Majesty's Forces, from the proceeds of prize captured in the late war. By virtue of this Act His Majesty will be able to grant prize money to the Royal Air Force as well as to the Royal Navy and Royal Marines, and a Royal Proclamation by His Majesty making a grant of prize money is expected very shortly.

His Majesty having been pleased to place his prerogative at the disposal of Parliament, this Act abolishes the prerogative rights to grant droits of Admiralty or droits of the Crown to officers or other persons seizing or taking prize in any future war. The Act also abolishes the prerogative right to grant prize bounty.

Investigations into entitlement to prize money and the preparation of forms (some 2½ million will need to be printed) are being progressed. The Admiralty expect to be able to invite applications early in the financial year.

ADMIRALTY OFFICE

The number of staff at Admiralty Headquarters stood at 11,990 on January 1, 1949, a reduction of 660 on the corresponding figure of 12,650 for January 1, 1948. Owing to the measures taken in the autumn of 1948 for reasons made public at the time, the total reduction over the whole of the calendar year 1948 was somewhat smaller than had been expected, but the downward trend in numbers will continue throughout the next twelve months.

Post-war terminal work is nearing completion save for a few special items, but the other factors mentioned last year in explanation of the need for much larger staffs than before the war continue to operate and will, in large measure, be permanent.

The Deputy Secretary of the Admiralty, Sir Richmond Walton, K.B.E., C.B., retired in May, 1948, after nearly 37 years of distinguished service in the Admiralty. He has been succeeded by Mr. R. R. Powell, C.M.G.

EVENTS OF NAVAL INTEREST DURING THE YEAR**NAVAL AIRCRAFT SQUADRON IN NORTH AMERICA**

In April, 1948, on the invitation of the Mayor of New York, a squadron of naval aircraft comprising two Sea Hornets, two Sea Furies, and one Sea Vampire, took part in the International Air Exposition at the new civil airport at Idlewild, and subsequently at the National Exhibition at Toronto. The squadron's performance won the highest praise and made a striking contribution to the prestige of the Royal Navy in the United States of America and Canada.

AMERICA AND WEST INDIES STATION

In the early months of 1948 H.M. Ships Sheffield and Sparrow visited ports in the Gulf of Mexico, the Caribbean, and on the north coast of South America. H.M.S. Sheffield visited Cartagena, enabling the Commander-in-Chief to visit Bogota during the Pan American Conference. H.M.S. Sheffield arrived back in Chatham in November of that year after sailing over 20,000 miles in two years.

In June, 1948, H.M.S. Sparrow was sent to Castries, St. Lucia, to deal with a serious fire which broke out in the commercial part of the town. Naval landing parties rendered valuable assistance in combating the fire, providing medical assistance, and re-establishing the administration.

H.M.S. DEVONSHIRE AT STOCKHOLM AND OSLO

The Cadet Training Cruiser H.M.S. Devonshire during her summer cruise visited Stockholm in time to take part in the ninetieth birthday celebrations of King Gustav of Sweden. H.M.S. Devonshire also visited Oslo, where a plaque to commemorate the rescue of the Norwegian Royal Family and Government by H.M.S. Devonshire in 1940 was presented to the ship by the Royal Norwegian Navy and unveiled by King Haakon.

FAR EAST STATION

In September, 1948 the British Pacific Fleet was renamed the Far East Fleet, and the Headquarters of the Commander-in-Chief were transferred from Hongkong to Singapore. This move is in accordance with the policy of H.M. Government to locate the Commanders-in-Chief of all the Forces in the Far Eastern theatre in the same locality.

LAUNCH OF H.M.S. BULWARK

The light fleet carrier H.M.S. Bulwark, which was built by Messrs. Harland and Wolff at Belfast, was launched on June 22, 1948, by Her Excellency the Countess Granville. H.M.S. Bulwark is a sister ship of H.M. Ships Albion and Centaur, which were launched in 1947.

RESCUES AT SEA

In October, 1948, H.M.S. Cossack, while on a courtesy visit to Keelung, responded to an S.O.S. from a Chinese vessel which had run aground on the coast of Formosa. The ship's company of H.M.S. Cossack rigged

jack stays and lifelines between the wreck and the shore, and under the most trying conditions rescue the Chinese vessel's 1,270 passengers.

In November, 1948 a vessel of the Fishery Protection Flotilla, H.M.S. Romola, provided another illustration of the skill and seamanship of the Royal Navy by rescuing the crew of the Grimsby trawler Mildenhall, which was wrecked in a gale off the North Russian coast. In a heavy sea on a rocky coast the crew of 21 were taken off by naval motorboat in pitch darkness and without adequate charts for guidance.

Outstanding among awards made during the past year was that of the Albert Medal to Boy First Class Alfred Raymond Lowe for gallantry in attempting to save the life of a midshipman, when a naval pinnace returning from Weymouth Pier to H.M.S. Illustrious on the night of October 17, 1948, overturned in a rough sea and sank.

**DRAFT ROYAL PROCLAMATION GRANTING PRIZE
MONEY TO THE ROYAL NAVY, THE ROYAL
MARINES, AND THE ROYAL AIR FORCE, AND
REGULATING ITS DISTRIBUTION TO THE
ROYAL NAVY AND ROYAL MARINES. NOVEM-
BER 1948**

(Cmd. 7549)

Whereas by the Prize Act, 1948, it is provided that if We are pleased by Proclamation or Order in Council to signify Our intention to make a grant of prize money out of the proceeds of prize captured in the late war, there shall be paid into the Royal Naval Prize Fund the sum of, or sums amounting in the aggregate to, four million pounds, and into the Royal Air Force Prize Fund the sum of, or sums amounting in the aggregate to, one million two hundred and fifty thousand pounds, and further that sums of such respective amounts as We may by the said Proclamation or Order in Council determine shall be distributed out of the Royal Naval Prize Fund, in such manner as We may so determine, to such persons who are or have been members of any of Our naval and marine forces, or of the crews, raised by Our Government in the United Kingdom, of any of Our ships of war, or in the case of their death to their representatives, as We may so determine :

And whereas by the Naval Agency and Distribution Act, 1864, it is provided that money distributable among the officers and crews of any of Our ships of war in respect of awards made in the several cases therein mentioned, so far as full provision respecting the distribution thereof is not made by or under any Act of Parliament other than that Act, shall be distributed under the direction of the Lords Commissioners of the Admiralty in the shares in that behalf specified in any Royal Proclamation or Order in Council :

We do therefore now make known to all Our loving subjects, and to all others whom it may concern by this Our Proclamation by and with the advice of Our Privy Council that Our Royal Will and Pleasure is that a grant of prize money shall be made out of the proceeds of prize captured in the late war and We do hereby determine that the sum or sums to be paid as aforesaid into the Royal Naval Prize Fund shall be distributed at such time as the Admiralty may direct

- (a) to such of the persons referred to in section 2 of the Prize Act, 1948, as are specified in the following regulations or, in the case of their death, to their representatives ; and
- (b) in such shares and proportions as are mentioned in those regulations :

1. Participation shall be allowed to each individual officer and man who performed service at sea for a period of not less than 180 days between September 3, 1939, and September 2, 1945, and who notifies the Admiralty of his claim to participate not later than 12 months from the date on which applications are invited by the Admiralty.

2. For the purposes of these regulations service at sea means service performed by persons

- (a) while borne for pay on the books of a seagoing ship of war;
- (b) while borne for pay on the books of a non-seagoing ship for service in a seagoing ship of war;
- (c) while borne for pay on the books of a non-seagoing ship for service in operational Coastal Force craft;
- (d) who went to sea as members of the regular crews of Combined Operations craft while borne for pay on the books of a non-seagoing ship for service in the Combined Operations organisation;
- (e) while borne for pay on the books of offensively armed auxiliary vessels or on the books of a non-seagoing ship for service in offensively armed auxiliary vessels;
- (f) while borne for pay on the books of a non-seagoing ship under T.124 agreements or variants thereof or under commissioned Admiralty cable-ship agreements for service in a seagoing ship of war.

3. Each individual officer and man shall be allotted the number of shares attributed by the scale appended to Regulation 8 to the rank or rating held by him on September 2, 1945, or on the date of his release, discharge, or death, if earlier. Officers, ratings, and other ranks holding higher paid temporary, acting temporary, probationary, or acting rank on such date shall be treated as though they had been confirmed in that rank.

4. Members of the Navy, Army, and Air Force Institute canteen staff who were entered in the Naval Canteen Service will be eligible for prize money under these regulations and shall be entitled to reckon service in canteens in Our seagoing ships from September 3, 1939, towards the qualifying period. Subject to the regulations governing misconduct, members of the Navy, Army, and Air Force Institute canteen staff who died, were invalided or otherwise ceased to serve after serving the qualifying period but before transfer to naval ratings in the Naval Canteen Service shall be treated as though they had entered the Naval Canteen Service with rating relative to their grade in the Navy, Army, and Air Force Institute Canteen Service at the time when they ceased to serve.

5. Persons who, having been members of the naval and marine forces raised by the Government of the United Kingdom, were before September 3, 1945, permanently transferred to the naval or marine forces of a Dominion, shall not be entitled to prize money under these regulations if on transfer to those forces they have become entitled to any prize money or equivalent benefits granted to naval or marine forces of that Dominion. Persons who, having been members of the naval and marine forces raised by the Government of a Dominion, were on or after September 3, 1945, permanently transferred to the naval or marine forces raised by the Government of the United Kingdom shall not be entitled to prize money under these regulations.

6. Members of the Section Belge shall not be entitled to prize money under these regulations.

7. No person who has incurred forfeiture of prize money under the Naval Discipline Act, or who has been dismissed from Our service or whose services have been terminated for misconduct shall be entitled to prize money under these regulations.

8. In the event of any question arising as to the interpretation of any of these regulations, or if any case should occur not herein provided for, the Admiralty shall be competent to issue such directions thereon as may appear just and expedient.

9. The distribution is to be made so that each officer, rating, and other rank entitled to participate shall receive shares according to his rank, rating, age, or seniority as set forth in the following scale, or if not so laid down as determined by the Admiralty.

<i>Rank or Relative Rank</i>										<i>Shares</i>
Admiral of the Fleet	..	..	..	..	..	..	..	..	..	10
Admiral	..	..	..	..	..	..	..	..	..	9
General R.M.	..	..	..	..	..	..	..	..	..
Vice-Admiral	..	..	..	..	..	..	..	..	..	8
Lieutenant-General R.M.	..	..	..	..	..	..	..	..	..
Rear-Admiral	..	..	..	..	..	..	..	..	..	7
Major-General R.M.	..	..	..	..	..	..	..	..	..
Chaplain of the Fleet	..	..	..	..	..	..	..	..	..	5
Commodore 1st and 2nd Class	..	..	..	..	..	..	..	..	..
Brigadier R.M.	..	..	..	..	..	..	..	..	..	4
Captain	..	..	..	..	..	..	..	..	..
Colonel Commandant R.M.	..	..	..	..	..	..	..	..	..	4
Colonel 2nd Commandant R.M.	..	..	..	..	..	..	..	..	..
Colonel R.M.	..	..	..	..	..	..	..	..	..	3.75
Lieutenant-Colonel R.M.	..	..	..	..	..	..	..	..	..
Chaplain of and over 15 years' seniority (if entered on or before 1.1.27)	..	..	..	..	..	..	..	..	..	3.5
Commander	..	..	..	..	..	..	..	..	..
Major R.M.	..	..	..	..	..	..	..	..	..	3.25
Chaplain of and over 14 years' seniority	..	..	..	..	..	..	..	..	..
Lieutenant-Commander	..	..	..	..	..	..	..	..	..	3
Captain R.M.	..	..	..	..	..	..	..	..	..
Chaplain of and over 6 years' seniority	..	..	..	..	..	..	..	..	..	3
Lieutenant	..	..	..	..	..	..	..	..	..
Lieutenant R.M. with not less than 4 years' officer service	..	..	..	..	..	..	..	..	..	3
Chaplain of under 6 years' seniority	..	..	..	..	..	..	..	..	..
Sub-Lieutenant	..	..	..	..	..	..	..	..	..	2
Commissioned Officer from Warrant Rank R.N. and R.M.	..	..	..	..	..	..	..	..	..
Lieutenant R.M. with less than 4 years' officer service	..	..	..	..	..	..	..	..	..	2
Acting Sub-Lieutenant	..	..	..	..	..	..	..	..	..
2nd Lieutenant R.M. over the age of 20	..	..	..	..	..	..	..	..	..	1.5
Warrant Officer R.N. and R.M.	..	..	..	..	..	..	..	..	..
Midshipman	..	..	..	..	..	..	..	..	..	1.25
2nd Lieutenant R.M. under the age of 20	..	..	..	..	..	..	..	..	..
Chief Petty Officer	..	..	..	..	..	..	..	..	..	1
Sergeant-Major R.M.	..	..	..	..	..	..	..	..	..
Staff Sergeant R.M.	..	..	..	..	..	..	..	..	..	1
Colour Sergeant R.M.	..	..	..	..	..	..	..	..	..
Naval Cadet	..	..	..	..	..	..	..	..	..	1
Petty Officer	..	..	..	..	..	..	..	..	..
Sergeant R.M.	..	..	..	..	..	..	..	..	..	1
Leading Seaman	..	..	..	..	..	..	..	..	..
Corporal R.M.	..	..	..	..	..	..	..	..	..	1
Able Seaman	..	..	..	..	..	..	..	..	..
Ordinary Seaman	..	..	..	..	..	..	..	..	..	1
Boy R.N.	..	..	..	..	..	..	..	..	..

Rank or Relative Rank									Shares
Lance-Corporal R.M.	..	..	..	..	..	..	..	} 1
Private R.M.	..	..	..	..	..	..	..
Boy R.M. ..	..	..	..	..	..	..	..
Officers serving on T.124 agreements and variants thereof and under commissioned Admiralty cable-ship agreements who were not granted temporary commissions or Naval rank—									
Radio Officer	..	..	..	..	..	..	..	3
Uncertificated Officer	..	..	..	..	..	..	..	3

BRITISH AND FOREIGN NAVIES

PRINCIPAL OFFICIALS

On January 1, 1949

GREAT BRITAIN

Board of Admiralty

First Lord.—The Right Honourable Viscount Hall.

First Sea Lord and Chief of Naval Staff.—Admiral of the Fleet Rt. Hon. Baron Fraser of North Cape, G.C.B., K.B.E.

Second Sea Lord and Chief of Naval Personnel.—Vice-Admiral Sir Cecil H. J. Harcourt, K.C.B., C.B.E.

Third Sea Lord and Controller.—Vice-Admiral Sir Charles S. Daniel, K.C.B., C.B.E., D.S.O.

Fourth Sea Lord and Chief of Supplies and Transport.—Vice-Admiral Herbert A. Packer, C.B., C.B.E.

Fifth Sea Lord and Deputy Chief of Naval Staff (Air).—Vice-Admiral Sir George E. Creasy, K.C.B., O.B.E., D.S.O., M.V.O.

Vice-Chief of Naval Staff.—Vice-Admiral Sir John H. Edleston, K.C.B., C.B.E.

Deputy Chief of Naval Staff.—Rear-Admiral Ralph A. B. Edwards, C.B.E.

Civil Lord.—Walter J. Edwards, Esq., M.P.

Parliamentary and Financial Secretary.—John Dugdale, Esq., M.P.

Permanent Secretary.—Sir John G. Lang, K.C.B.

FOREIGN POWERS

Country	Minister	Title of Office	Chief of Staff
Argentina ..	Rear-Admiral B. Garcia	Minister of Marine	Rear-Admiral Juan Gar- ranza (Chief of Naval Operations).
Albania ..	Colonel - General Enver Hoxha	Commander-in-Chief Armed Forces	Lieutenant-Commander Abdi Mati.
Belgium ..	Colonel R. De Fraiteur Commodore G. Timmer- mans	Minister of Defence Commander-in-Chief	Commander L. J. Robins.
Brazil ..	Vice-Admiral Sylvio de Noronha	Minister of Marine	Rear-Admiral Lara de Almeida.
Bulgaria ..	General Damyanov Captain (1) Kalachev	Minister of Defence Commander-in-Chief Navy	Captain (1st grade) Pas- paleev.
Chile ..	Vice-Admiral Carlos Torres	Commander-in-Chief Navy	Rear - Admiral Julio Sabitanes.
China ..	Vice-Admiral (Lieutenant- General) Kuei Yung-Ching	Commander-in-Chief Navy	Rear-Admiral Chou Hsien- Chang.
Columbia ..	Captain de Corbetta Ruben Piedrahita	Director-General of the Navy	—
Cuba ..	Senor Roman Nodal	Minister of Defence	Commodore Pedro Pascual.
Ecuador ..	Captain Cesar Endara	Inspector-General	—
France ..	M. Ramadier M. Joannes-Dupraz Vice-Admiral R. G. Lambert, C.B.E.	Minister of Defence Secretary of State, Navy Commander - in - Chief (Designate).	Admiral A. G. Lemonnier.
Greece ..	Mr. A. Vasileiades	Minister of Marine	Rear-Admiral P. Antono- poulos.
Hungary ..	—	—	—
Italy ..	Signor R. Pacciardi Admiral Romeo Oliva	Minister of Defence Commander-in-Chief	Admiral Emilio Ferreri.
Mexico ..	Commodore David Coello Ochoa	Minister of Marine	Commander Serafin Pizarro.
Netherlands ..	Mr. W. F. Schokking	Minister of Defence	Vice-Admiral Van Holthe, K.M.G. (and Com- mander-in-Chief Navy).
Peru ..	Rear-Admiral Roque a Saldias	Minister of Marine	Rear - Admiral Enrique Labarthe.
Poland ..	Vice-Admiral Steyer Marshal Zymierski	Commander-in-Chief Navy Minister of Defence	Commodore Urbanovich.
Portugal ..	Captain A. Tornaz	Minister of Marine	Rear-Admiral F. de Oliveira Pinto, O.B.E.
Roumania ..	Colonel-General Bodnarus Captain Christescu	Minister of Defence Commander-in-Chief Navy	—
Spain ..	Rear - Admiral Regalado Rodriguez Vice - Admiral Moreno Fernandez	Minister of Marine Commander-in-Chief	Admiral Arriaga Adam.
Turkey ..	General Salih Omurtag Admiral M. A. Ulgen	Commander of Armed Forces Commander-in-Chief Navy	Rear-Admiral N. Özdenis.
United States ..	Mr. John L. Sullivan	Secretary of the Navy	Admiral Louis E. Denfield (Chief of Naval Opera- tions).
Uruguay ..	Captain Juan Angel Battione	Inspector-General	—
U.S.S.R. ..	Marshal Bulganin Admiral I. G. Yumashev	Minister of Defence Commander-in-Chief Navy	Admiral A. G. Golovko.
Venezuela ..	Commander Wolfgana Lar- razabal	Inspector-General of the Navy	—
Yugoslavia ..	Marshal Tito Colonel - General Ivan Gosnjak	Supreme Commander Deputy War Minister	Vice-Admiral Gerni (Com- mander-in-Chief).
Siam ..	Vice-Admiral Luang Sindhu	Commander-in-Chief Navy	—

BRITISH NAVAL MISSIONS IN FOREIGN COUNTRIES

On February 1, 1949

British Representative on Military Staff, Rear-Admiral Lord Ashbourne, D.S.O.
Committee of Security Council, U.N.O.

British Naval Mission to Greece

Head	Rear-Admiral D. Young-Jamieson, C.B.
Chief Staff Officer	Captain M. S. Townsend, D.S.O., O.B.E., D.S.C., R.N.

BRITISH AND FOREIGN NAVAL ATTACHÉS

On January 1, 1949

BRITISH NAVAL ATTACHÉS AND ASSISTANT NAVAL ATTACHÉS ACCREDITED TO FOREIGN COUNTRIES

Countries to which accredited	Name	Appointed	Headquarters
Argentina, Uruguay, Paraguay	Captain D. E. Holland-Martin, D.S.O., D.S.C.	6 May, 1947	Buenos Aires
Brazil, Venezuela	Captain B. J. Fisher, D.S.O.	June 14, 1947	Rio de Janeiro
Chile, Peru, Colombia, Ecuador	Captain J. J. Weld, M.V.O.	Oct. 2, 1948	Santiago
China	Captain V. D'A Donaldson	May 24, 1948	Nanking
	Commander J. Pringle (A.N.A.)	Dec. 30, 1948	Shanghai
Denmark	Commander R. S. Christian-Edwards	June 29, 1948	Copenhagen
France	Captain C. D. Howard-Johnston D.S.O., D.S.C.	Jan. 1, 1948	Paris
	Commander J. de F. Jago (A.N.A. Air	Feb. 17, 1947	
France, Switzerland, Czecho-	Commander (E.) E. A. Read (A.N.A.)	Nov. 22, 1948	"
slovakia, Holland, Italy	(Technical)		
Holland, Belgium	Commander E. Neville (Act).	Sept. 15, 1947	The Hague (and Brussels)
Italy	Captain J. D. Shaw-Hamilton	April 17, 1947	Rome
Mexico, Cuba, Guatamala,	Commander C. E. A. Owen, D.S.C.	Oct. 11, 1947	Mexico City
Salvador, Honduras, Nica-			
ragua, Costa Rica, Haiti,			
Dominican Republic			
Norway	Captain R. E. D. Ryder, V.C.	Mar. 14, 1948	Oslo
Poland	Captain J. H. Ruck-Keene, O.B.E., D.S.C.	Sept. 3, 1947	Warsaw
	Lieut.-Com. J. A. Holdsworth (A.N.A.)	Aug. 26, 1947	"
Portugal	Commander J. W. McClelland, D.S.O.	Sept. 6, 1946	Lisbon
Rumania, Bulgaria, Hungary..	Commander J. W. F. D. Cowgill	June 5, 1947	Bucharest
Siam, Saigon (French Indo-	Commander D. F. Townsend	July 1, 1948	Bangkok
China			
Spain	Post vacant	—	Madrid
Sweden	Commander F. W. R. Larken	Dec. 15, 1947	Stockholm
Sweden and Denmark	Commander (E.) H. G. R. Binning (A.N.A.) (Technical)	May 29, 1948	"
Turkey	Captain J. R. S. Brown	Oct. 14, 1948	Ankara
	Lieut.-Com. G. V. Corbett (A.N.A.)	Feb. 12, 1948	Istanbul
U.S.A., Panama	Captain J. Holmes	Oct., 1948	Washington
	Commander F. H. E. Hopkins, D.S.O., D.S.C. (A.N.A. Air)	Jan. 3, 1948	"
	Commander (E.) J. E. Best (A.N.A.) (Technical)	Sept. 17, 1947	"
U.S.S.R., Finland	Post temporarily vacant	—	Moscow
U.S.S.R. only	Lieutenant A. G. Howard (A.N.A.)	July 10, 1947	"
Yugoslavia	Commander W. W. Fitzroy	May 27, 1947	Belgrade

FOREIGN NAVAL ATTACHÉS ACCREDITED TO GREAT BRITAIN

Argentina: Captain Victorio Malatesta.

Belgium: Lieut.-Col. A. Bigwood (Military Attaché).

Brazil: Captain Paulo N. Penido, O.B.E.

Burma: Major-General Tun Hla Oung (Military, Air, and Naval Attaché).

Chile: Commander Kaare Olsen.

China: Commander Chen Tsui-Tsang.

Czechoslovakia: Lieut.-Col. Miloslav Zatrepacek (Military and Air Attaché).

Denmark: Commodore E. J. C. Qvistgaard (Naval and Air Attaché).
Dominican Republic: Captain Cesar de Windt.
Egypt: Colonel A. H. Ghaleb Bey (Military Attaché).
Finland: Major Birger R. Ek (Military, Air, and Naval Attaché).
France: Rear-Admiral L. M. P. A. Sala, C.B.E., D.S.O.
Greece: Captain Basil Kyris, C.B.E.
Italy: Captain Paolo Mengarini.
Mexico: Commander Jose H. Orozco.
Netherlands: Commander K. J. F. Krediet, O.B.E.
Norway: Commodore Hans P. Henriksen, C.B.E.
Peru: (Post vacant.)
Poland: (Post vacant.)
Portugal: Commander Jose Conceicao da Rocha, O.B.E.
Siam: Captain Swai Sribhadung.
Soviet Union: Captain (1st Grade) Vassili D. Yakovlev, C.B.E. (Naval Attaché and Naval Attaché for Air).
Spain: Commander Ignacio Martel.
Sweden: Commodore J. E. Gester.
Switzerland: Lieut.-Col. Jean G. Rieser (Military and Air Attaché).
Turkey: Captain Azim Sinik.
U.S.A.: Commodore Tully Shelley, C.B.E. (Naval Attaché and Naval Attaché for Air).
Uruguay (Post vacant.)
Yugoslavia: Lieut.-Col. Vangel Cukalevski (Military, Air, and Naval Attaché).

PICTORIAL SECTION

PICTORIAL SECTION

SILHOUETTES OF WARSHIPS.

CAPITAL SHIPS.

[Dimensions and particulars of British and foreign warships will be found on pp. 79-171. All the profiles are drawn to the scale $\frac{1}{4}$ in. = 100 ft.]

[An Index to the names of vessels of which profiles are included in this section are given at the end of the volume.]



GREAT BRITAIN. Battleship. Vanguard.



GREAT BRITAIN. Battleships. King George V., Duke of York, Howe, Anson.
Tripod mainmast.



GREAT BRITAIN. Battleships. Nelson, Rodney.
Mast structure increased.



GREAT BRITAIN. Battleships. Royal Sovereign (to be scrapped 1949).



UNITED STATES. Battleships. Iowa, Missouri, New Jersey, Wisconsin, Kentucky.
(Kentucky will be different when re-armed.)



UNITED STATES. Battleships. Alabama, Indiana, Massachusetts, South Dakota.



UNITED STATES. Battleships. Washington, North Carolina.



UNITED STATES. Battleships. Idaho, Mississippi, New Mexico.



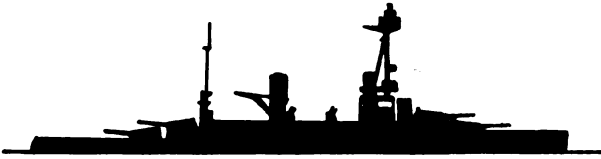
UNITED STATES. Battleship. West Virginia.



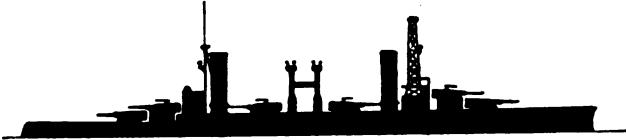
UNITED STATES. Battle-cruisers. Alaska, Guam, Hawaii.
(Hawaii will be different when re-armed.)



FRANCE. Battleship. Richelieu.



FRANCE. Battleship. Lorraine.



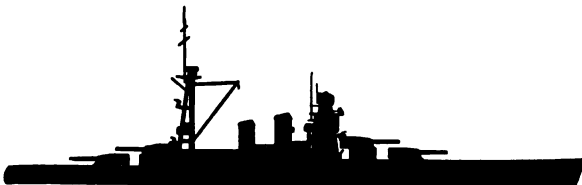
ARGENTINA. Battleships. Moreno, Rivadavia.
Guns on B and X turrets replaced by range-finders.



BRAZIL. Battleships. Minas Geraes, São Paulo.



CHILE. Battleship. Almirante Latorre.
(Modernised 1931—mainmast raised and bridgework altered.)
Catapult fitted on quarter deck.



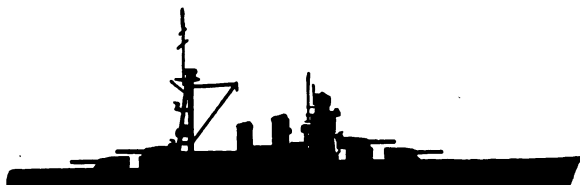
ITALY. Battleships. Andrea Doria, Caio Dulio.
Bridge modified, pole mainmast.



TURKEY. Battle-cruiser. Yavuz Sultan Selim.

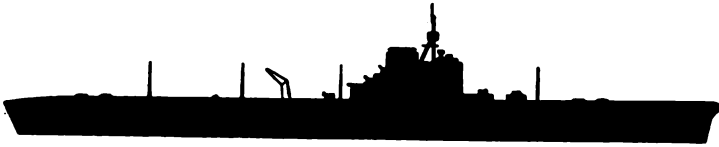


SOVIET UNION. Battleships. Marat, Paris Commune and October Revolution.
Two derricks fitted between mainmast and turret in Marat and Paris Commune.
Crane fitted abreast mainmast in October Revolution.



SOVIET UNION. Battleship. Giulio Cesare.

**AIRCRAFT AND SEAPLANE CARRIERS AND
TENDERS.**



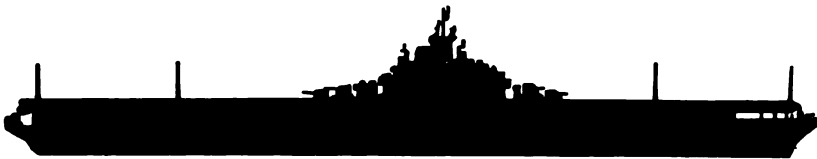
GREAT BRITAIN. Aircraft Carriers. Illustrious, Victorious, Formidable, Indomitable.



GREAT BRITAIN. Light Fleet Carrier. ("Colossus" class.



UNITED STATES. Aircraft Carriers. Midway, Franklin D. Roosevelt, Coral Sea.



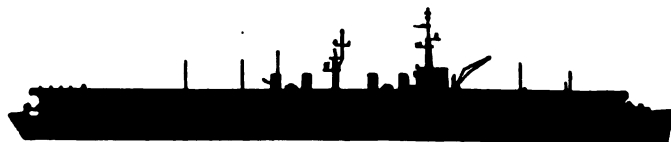
UNITED STATES. Aircraft Carriers. ("Essex" class.)



UNITED STATES. Aircraft Carrier. Enterprise.



UNITED STATES. Aircraft Carrier. Ranger.
 (NOTE.—Funnels hinge outboard.)



UNITED STATES. Light Aircraft Carrier. ("Salpan" class.)



UNITED STATES. Light Aircraft Carrier. ("Independence" class.)



UNITED STATES. Escort Carrier. ("Commencement Bay" class.)



FRANCE. Light Fleet Carrier. Arromanches.

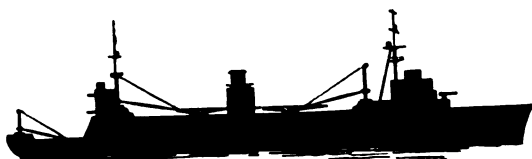


FRANCE. Escort Carrier. Dixmude.



FRANCE. Aircraft Transport. Béarn.

Space between flight deck and upper deck forward partially blanked off.
Framework fitted on aft side of funnel.



FRANCE. Aviation Transport. Commandant Teste.

CRUISERS AND COAST DEFENCE SHIPS.



GREAT BRITAIN. Cruiser. London.



GREAT BRITAIN. Cruisers. Devonshire, Sussex. ("Norfolk" class.) Norfolk.
Fore topgallant mast added.

ROYAL AUSTRALIAN NAVY. Cruiser. Shropshire.



GREAT BRITAIN. Cruisers. ("Kent" class.) Cumberland.

ROYAL AUSTRALIAN NAVY. Cruiser. ("Kent" class.) Australia.
No hangars fitted. Flush-deck.



GREAT BRITAIN. Cruisers. ("Fiji" class.) Ceylon, Jamaica, Gambia, Kenya, Mauritius, Nigeria, Newfoundland.

ROYAL CANADIAN NAVY. Cruiser. ("Fiji" class.) Uganda.



GREAT BRITAIN. Cruiser. (Improved "Southampton" class.) Belfast.
Aircraft removed.



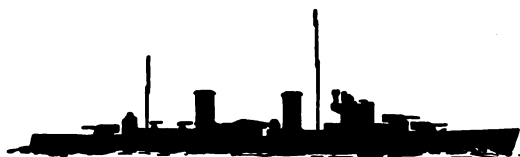
GREAT BRITAIN. Cruisers. ("Southampton" class.) Newcastle, Sheffield, Birmingham, Glasgow, Liverpool.
Aircraft removed.



ROYAL AUSTRALIAN NAVY. Cruiser. (Modified "Leander" class.) Hobart.
Aircraft removed.



ROYAL INDIAN NAVY. Cruiser. ("Leander" class.) Delhi.



GREAT BRITAIN. Cruiser. ("Arethusa" class.) Arethusa.
Derrick fitted on aft side of after funnel.



GREAT BRITAIN. Cruisers. ("Dido" class.)
ROYAL NEW ZEALAND NAVY. Cruisers. ("Dido" class.) Bellona, Black Prince.



UNITED STATES, Cruiser. Oregon City.



UNITED STATES. Cruisers. ("Baltimore" class.)



UNITED STATES. Cruiser. Wichita.



UNITED STATES. Cruisers. ("New Orleans" class.) New Orleans, Minneapolis, San Francisco, Tuscaloosa.



UNITED STATES. Cruiser. ("Cleveland" Class.)



UNITED STATES. Cruiser. ("Fargo" Class.)



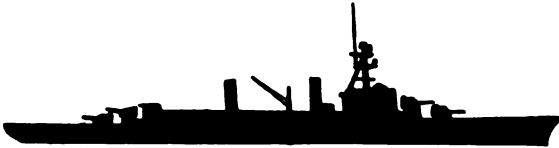
UNITED STATES. Cruiser. ("San Diego" Class.)



FRANCE. Cruisers. ("Duquesne" class.) Duquesne, Tourville and Suffren.



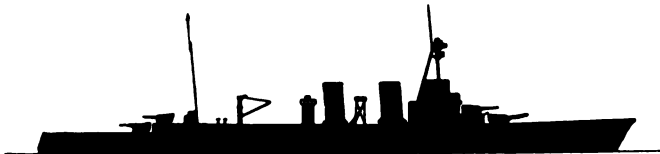
FRANCE. Cruisers. Gloire, Montcalm, Georges Leygues.



FRANCE. Training Cruiser. Jeanne d'Arc.



FRANCE. Cruiser Minelayer. Emile Bertin.



FRANCE. Cruiser. Duguay-Trouin.
Catapult fitted on quarter deck.
Fore topmast removed and mast head modified.



FRANCE. Light Cruiser. ("Le Malin" class.)

CRUISERS



FRANCE. Light Cruisers. Cassard, Vauquelin, Kersaint, Tartu, Le Chevalier Paul, Algé, Albatros, Epervier, Milan, Gerfaut, Vautour.



FRANCE. Light Cruisers. Tigre, Léopard, Lynx.
Platform added before after turrets.



ARGENTINA. Cruiser. La Argentina.



ARGENTINA. Cruisers. Almirante Brown, Vintcento de Mayo.
Derrick fitted on fore side of mainmast.
Superstructure built on aft side of mainmast.



DENMARK. Cruiser. Niels Juel.



GREECE. Cruiser. *Ex-Italian* ("Attendolo" class). Eugenio di Savoia.



GREECE. Cruiser. Giorgios Averoff (to be scrapped).



ITALY. Cruiser. Luigi di Savoia, Giuseppe Garibaldi.



ITALY. Cruiser. Montecuccoli.



ITALY. Cruiser. Luigi Cadorna.



NETHERLANDS. Cruiser. Tromp.



NORWAY. Minelaying and Training Ship. Olav Trygvason.
Both cranes are fitted abreast mainmast.



SPAIN. Cruiser. Canarias.
Masts removed.



SPAIN. Cruisers. Galicia, Almirante Cervera, Miguel de Cervantes
The mainmasts are tripods.
Fore topmast and topgallant mast removed.



SPAIN. Cruiser. Navarra (ex-Republica).



SPAIN. Light Cruiser. Mendez Núñez.

Foremast is tripod. Fore topgallant mast added.
A.A. armament fitted between second funnel and mainmast.
Searchlight platform fitted round after funnel.



SWEDEN. Cruiser. Göta Lejon, Tre Kronor.



SWEDEN. Aircraft Cruiser. Gotland.

Has been reconstructed as A.A. cruiser.



SWEDEN. Coast Defence Ship. Gustav V.

Mainmast and derrick removed.



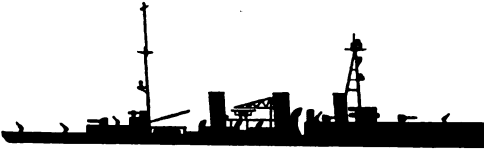
SWEDEN. Coast Defence Ship. Sverige.



SWEDEN. Coast Defence Ship. Drottning Victoria.



SOVIET UNION. Cruisers. Kirov Class (later vessels).



SOVIET UNION. Cruiser. Profintern. (Now Krasny Krym).



**SOVIET UNION. Cruiser. Krasni Kavkaz.
Catapult fitted between mainmast and funnel.
A.A. guns fitted between funnels.**



SOVIET UNION. Cruiser. Admiral Makaroff.



SOVIET UNION. Cruiser. (Ex-Italian Filiberto Duca d'Aosta.)



SOVIET UNION. Armoured Gunboat. Vainämöinen.

FLOTILLA LEADERS AND DESTROYERS.



GREAT BRITAIN. Destroyers. "Weapon" class. Crossbow and Scorpion have both mounts forward.



GREAT BRITAIN. Destroyers. "Zephyr" class.



GREAT BRITAIN. Destroyers. "Battle" class.



GREAT BRITAIN. Destroyers. "Hunt" class.
Also serving with Greek and Norwegian navies.



ROYAL AUSTRALIAN and ROYAL CANADIAN NAVIES. Destroyers. "Tribal" class.
Pole mainmast.



GREAT BRITAIN. Destroyers. "Javelin" and "Kelly" classes.



ROYAL AUSTRALIAN NAVY. Flotilla Leader. Stuart.

SPAIN. Flotilla Leaders. Almirante Valdes, etc., generally similar.



UNITED STATES. Destroyers. "Sumner" class (long hull).



UNITED STATES. Destroyers. "Sumner" (short hull).



UNITED STATES. Destroyers. "Fletcher" class.



UNITED STATES. Destroyers. "Benson" class.



UNITED STATES. Destroyers. "Gridley" class.



FRANCE. Destroyers. Mistral, Ouragon, Simoun, Tempête, Tramontane, Typhon, Trombe, Tornado.

POLAND. Destroyer. Burza is similar. Mainmast shortened.



FRANCE. Destroyer. Desaix.



FRANCE. Destroyer. (Ex-A. Oriani.)



ARGENTINA. Flotilla Leaders. Mendoza, La Rioja, Tucuman.



CHILE. Destroyers. Serrano, Orella, Riquelme, Hyatt, Videla, Alda. Mainmast heightened.



DENMARK. Torpedo Boats (1st Class). Glentien, Høgen, Ornen, Laxen, Dragen, Hvalen.



GREECE. Destroyers. Spetzai and Countouriotis.



ITALY. Flotilla Leader. Nicotro da Recco.



PORTUGAL. Destroyers. Vouga, Lima, Dao, Tejo, Douro.



POLAND. Destroyer. Blyskawica.

COLOMBIA. Destroyers. Antioquia, Caldas.



SWEDEN. Flotilla Leader. "Öland" class.



SWEDEN. Destroyers. Klas Horn, Klas Uggla, Ehrensköld, Nordenskjöld. Davit fitted at stern.



SOVIET UNION. Destroyers. "Leningrad" class.



SOVIET UNION. Destroyers. "Stromitel'" class.

SOVIET UNION. Destroyers. See also silhouettes of French "Desaix" class (ex-German).



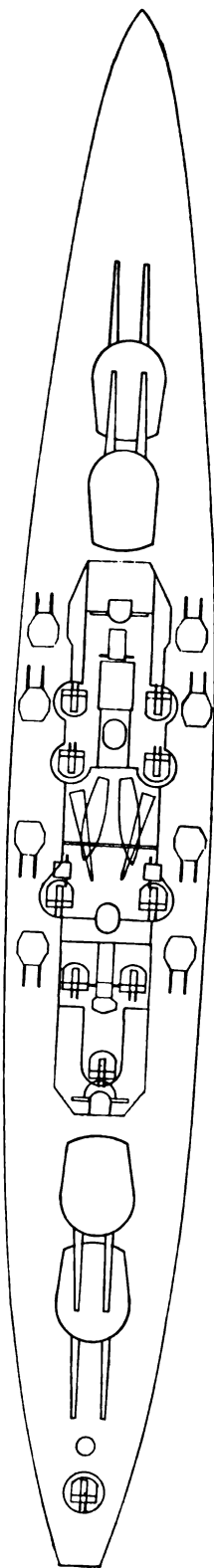
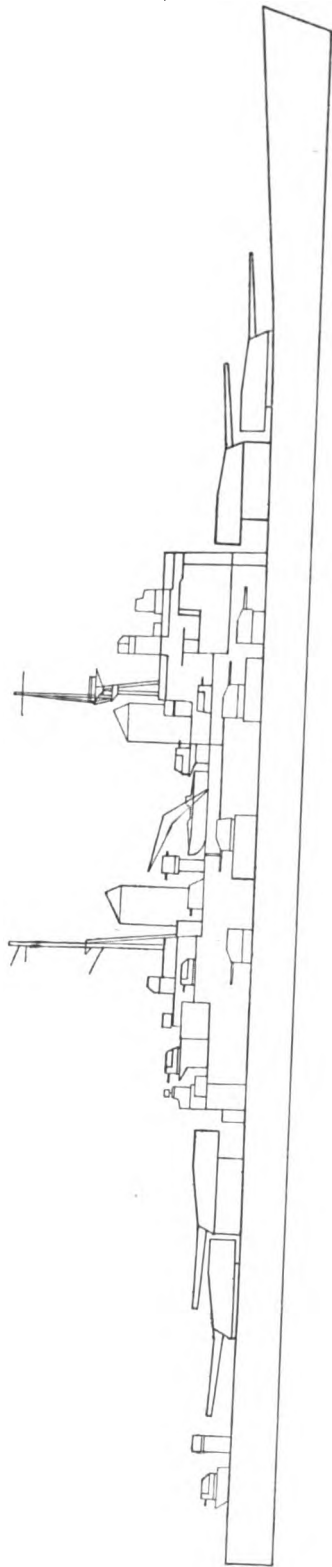
SOVIET UNION. Flotilla Leader. "Opitni" class.



SOVIET UNION. Flotilla Leader. (Ex-Augusto Riboty.)

PICTORIAL SECTION PLANS AND ELEVATIONS OF WARSHIPS.

GREAT BRITAIN.
BATTLESHIPS.
Vanguard.

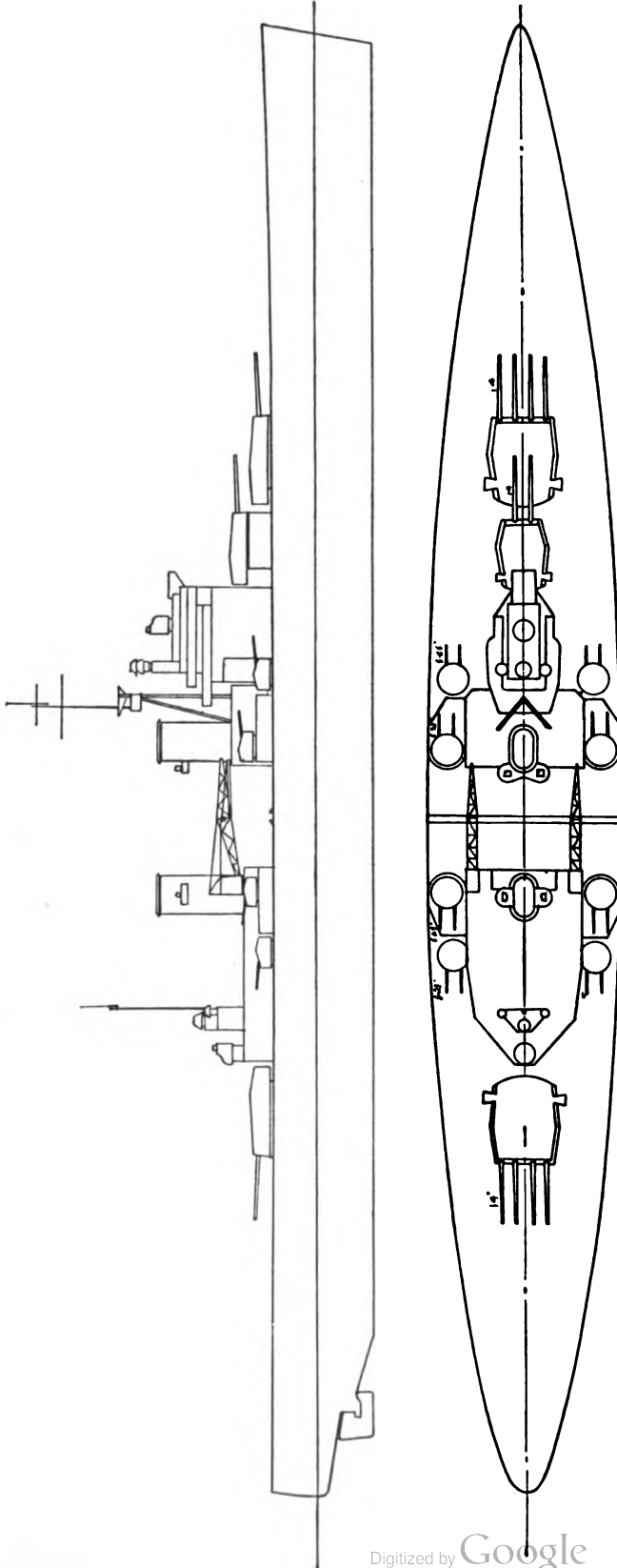


Length 814 ft. ; 42,500 tons ; Completed 1946.
Armament, 8—15-in. ; 16—5-25 ; many smaller A.A.

GREAT BRITAIN.

BATTLESHIPS

King George V. Duke of York. Howe. Anson.

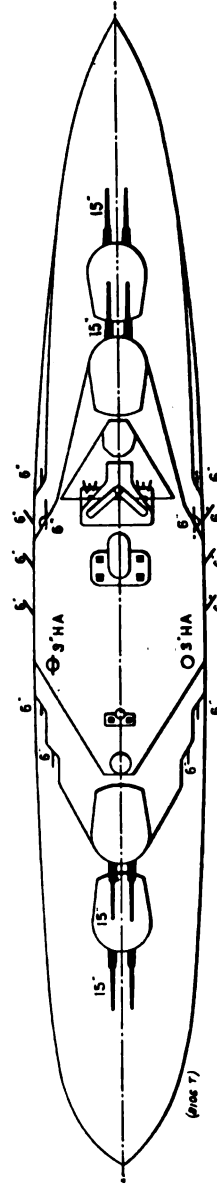
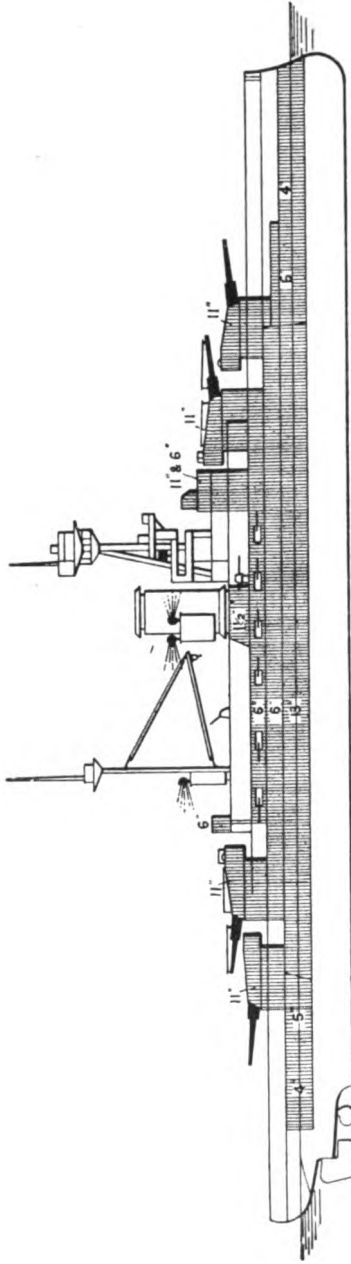


Length 745 ft.; 35,000 tons; Completed 1941-42.
Armament, 10-14-in.; 16-5.25-in.; many light A.A. guns.
Catapult removed. Deck raised between funnels.

GREAT BRITAIN.

BATTLESHIP.

Royal Sovereign.



Length (extreme), 690 ft. 6 in. ; Length R.P., 580 ft. ; 20,150 tons ; Speed, 23 knots (without bulges) ; Completed, 1916-17.
 Armament, 8-15-in., 12-6-in. ; 2-4-in. A.A. ; 4-3-pr. 5 M. ; 11 L. ; 2-21-in. submerged torpedo tubes in Revenge.
 Corrections to plan.—Searchlights on mainmast, and the superstructure 6-in. guns now removed. The 4-in. A.A. guns are fitted on the superstructure instead of the 8-in. H.A. shown. Fore topmast removed. Main topgallant mast fitted.

GREAT BRITAIN.

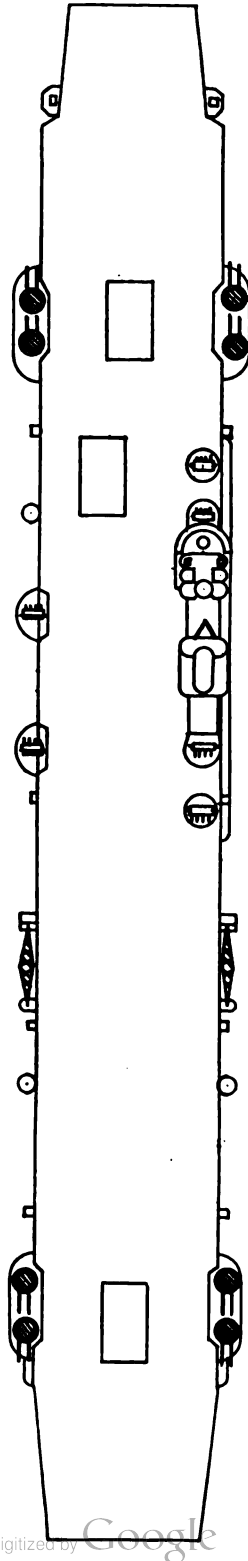
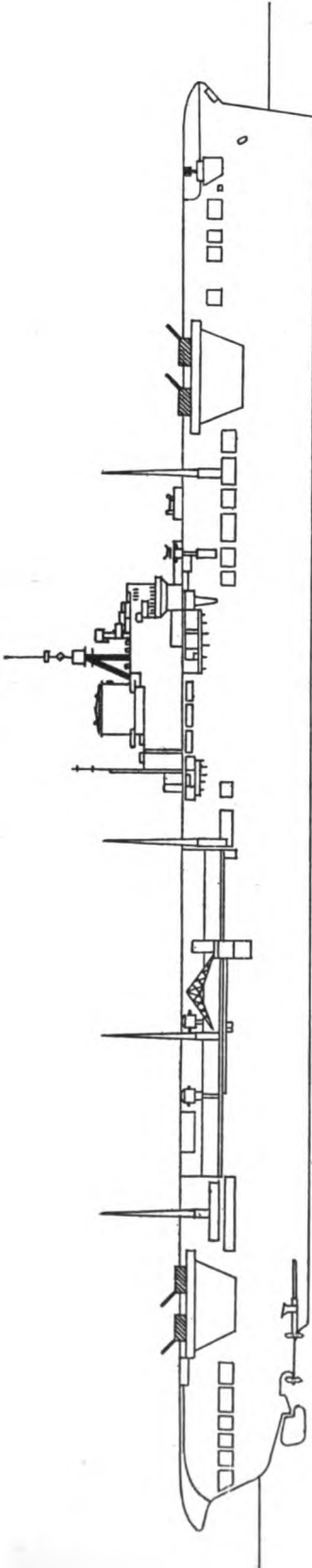
AIRCRAFT CARRIERS.

Illustrious.

Victorious.

Formidable.

Indomitable.

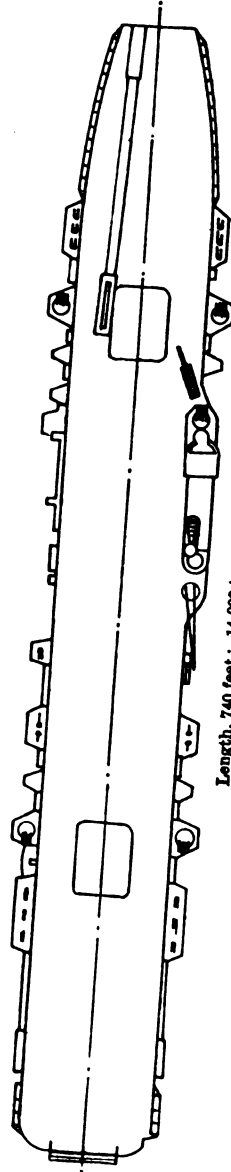
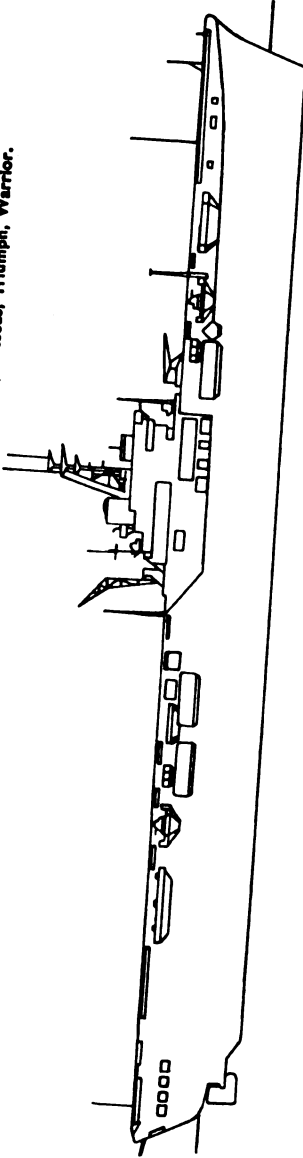


Length, 740 ft. ; 23,000 tons; speed, 30½ knots.
Illustrious completed, 1940; Victorious, 1941; Formidable, 1940; Indomitable, 1941.
Armament 16—4.5-in. guns; 20 smaller.

GREAT BRITAIN.

LIGHT FLEET AIRCRAFT CARRIERS.

"Colossus" class. Colossus, Vengeance, Venerable, Glory, Ocean, Perseus, Theseus, Triumph, Warrior.



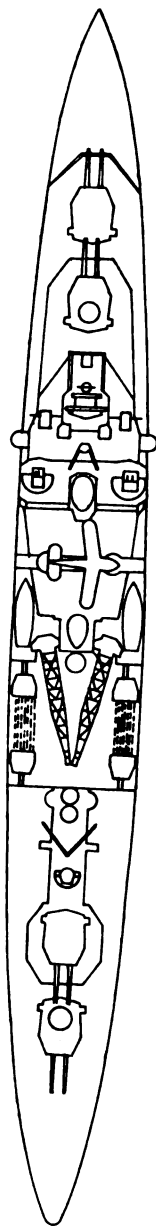
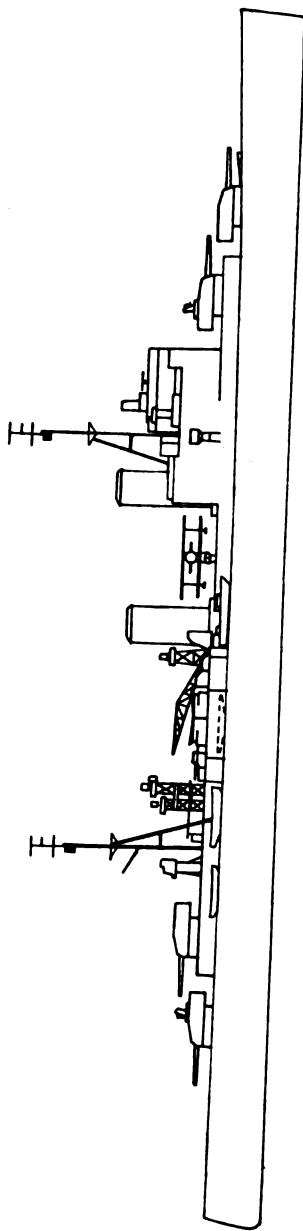
Length, 740 feet; 14,000 tons; Speed, 28 knots.
Armament, 6 m.p.ps.; a number of light A.A. guns.
Colossus is now French ship Arramanches (on loan).
Venerable is now Dutch ship Karel Doorman.

GREAT BRITAIN.

CRUISERS.

"London" Class.

London.



Displacement, 10,000 tons; length, 680 ft.; speed, 32½ knots.
Armament, 8—8-in.; 8—4-in.; many smaller.

GREAT BRITAIN:

CRUISERS.

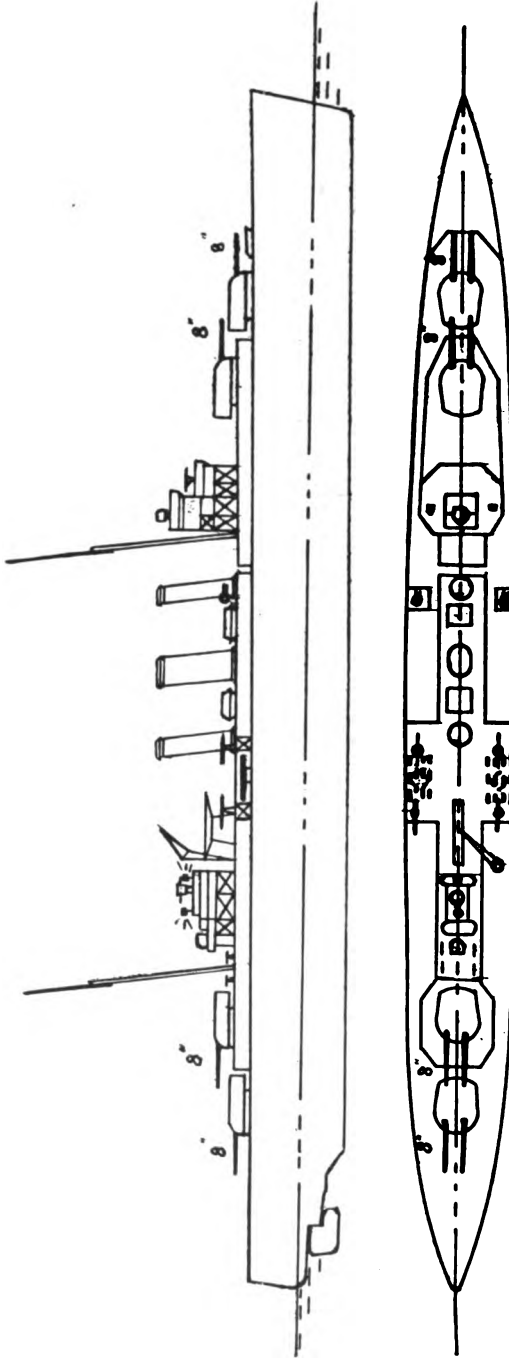
"London" Class.

Sussex. Devonshire.

Royal Australian Navy. Cruiser. Shropshire.

"Norfolk" Class.

Norfolk.



Displacements, 9,860 tons; Length (extreme), 630 ft.; Sussex and Norfolk, 633 ft.; Speed, 32½ knots. Armament, 8-8-in.; 8-4-in. A.A.: many light A.A. guns; 8-21-in. torpedo tubes.

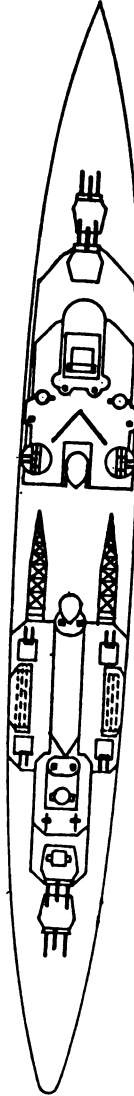
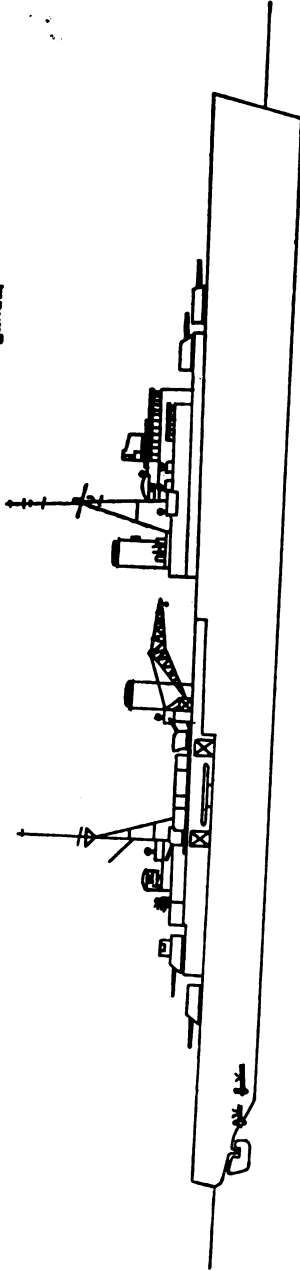
Fore topgallant mast added. Fore and main masts are tripped. Aircraft arrangements removed.

GREAT BRITAIN.

CRUISERS.

"Fiji" Class.

Bermuda. Jamaica. Mauritius. Kenya. Nigeria. Gambia. Uganda.*



Length (extreme), 565 ft. 6 in.; 8,000 tons; Speed, 32 knots; Completed, 1940-42.
Armament: 12-6-in.; 8-4-in. A.A.; 16 smaller.

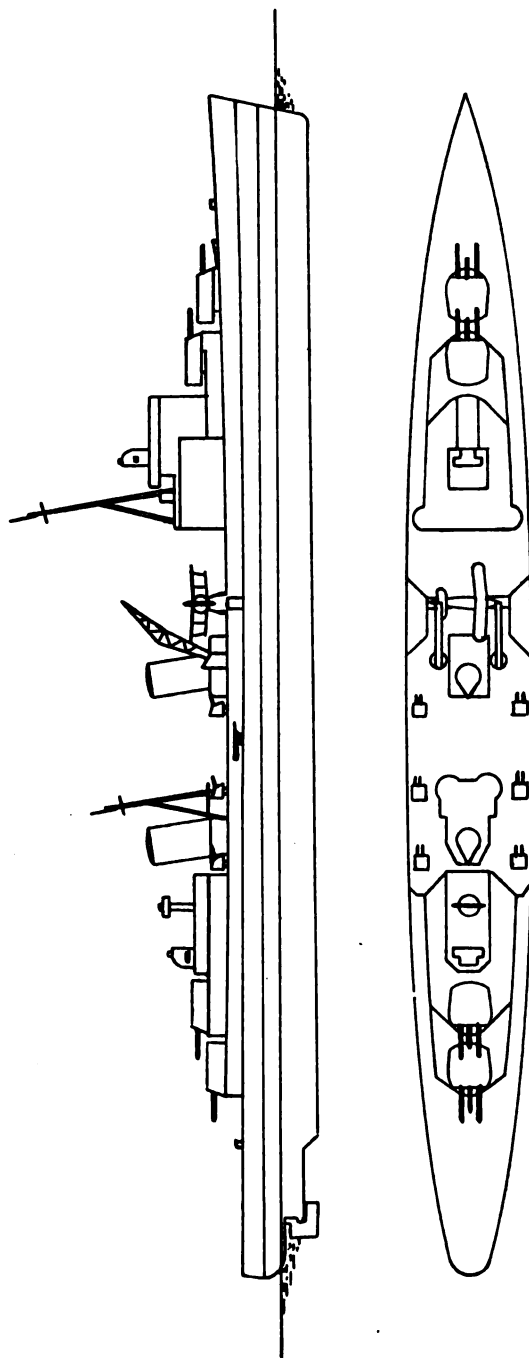
Bermuda and Jamaica have 9 6-in. Aircraft removed.
* Royal Canadian Navy.

GREAT BRITAIN.

CRUISER.

Improved "Southampton" Class.

Belfast.

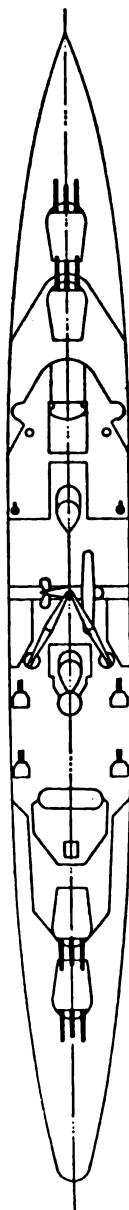
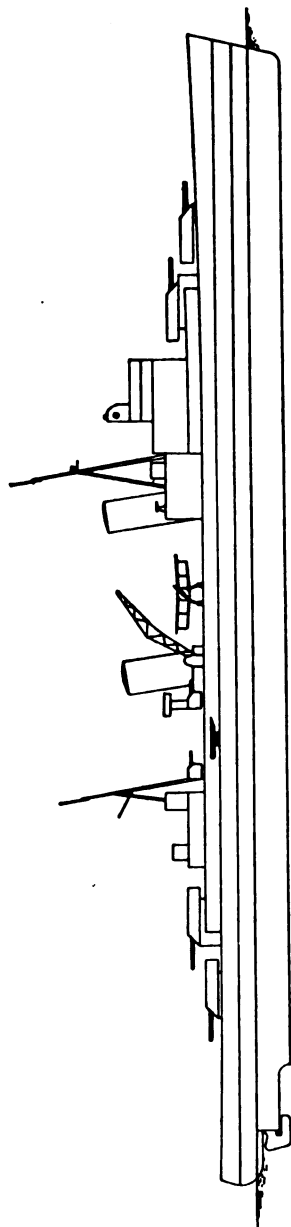


**Length (extreme), 613 ft. 6 in.; 10,000 tons; Speed, 32½ knots; Completed, 1909.
Armament, 12—6-in.; 8—4-in. A.A.; 20 smaller guns; 6 torpedo tubes.**

GREAT BRITAIN.
CRUSERS.

"Southampton" Class.

Newcastle. Sheffield. Birmingham. Glasgow. Liverpool.



Length (extreme), 591 ft. 6 ins.; 9,100 tons (Liverpool 9,400 tons); Speed, 32 knots; Completed, 1987-88.

Armament, 12-6-in.; 8-4-in. A.A.; 6-21-in. torpedo tubes.

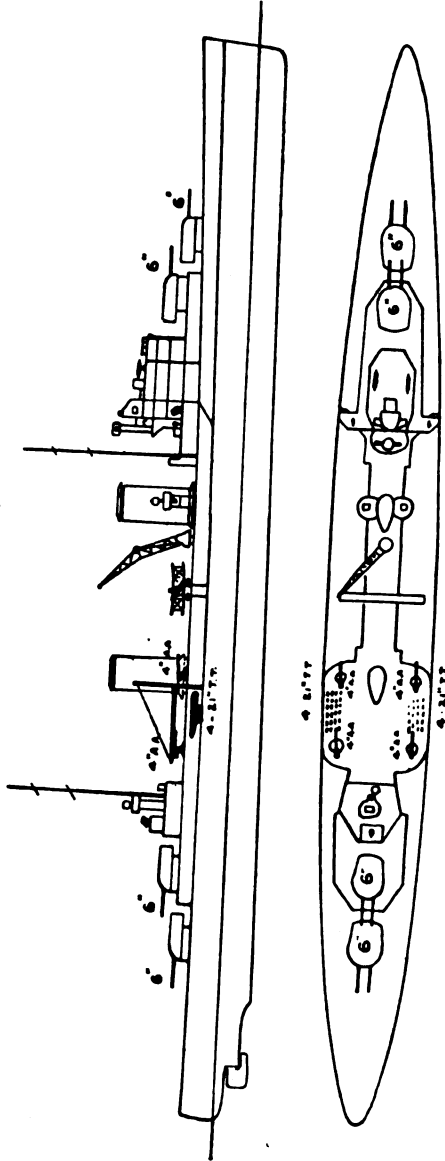
Corrections—1 6-in. turret and aircraft removed.

COMMONWEALTH OF AUSTRALIA.

CRUISER.

Modified "Leander" Class.

Hobart (ex-Apollo).



Displacement, 7,000 tons; Length (extreme), 562 ft.; Speed, 32½ knots; Completed, 1926.
Armament, 8—6-in.; 8—4-in. A.A.; 18 smaller guns; 8—12-in. torpedo tubes.
Aircraft removed.

GREAT BRITAIN.

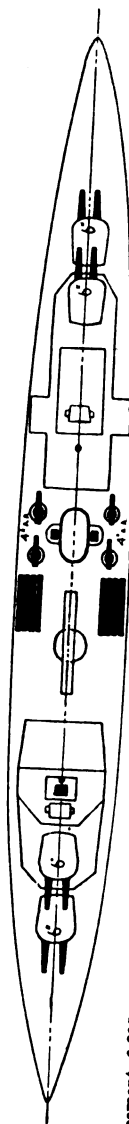
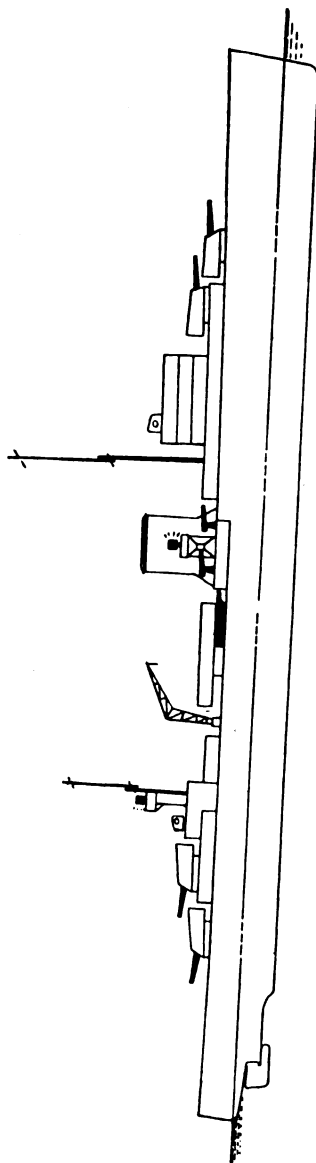
CRUISERS

"Leander Class."

Leander.

Orion.

Ajax.



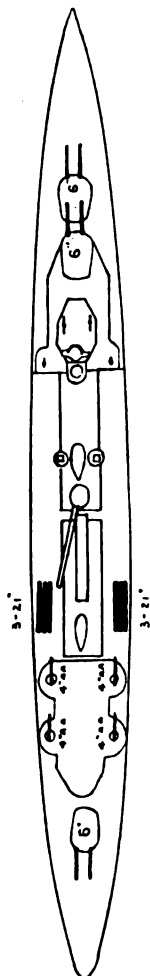
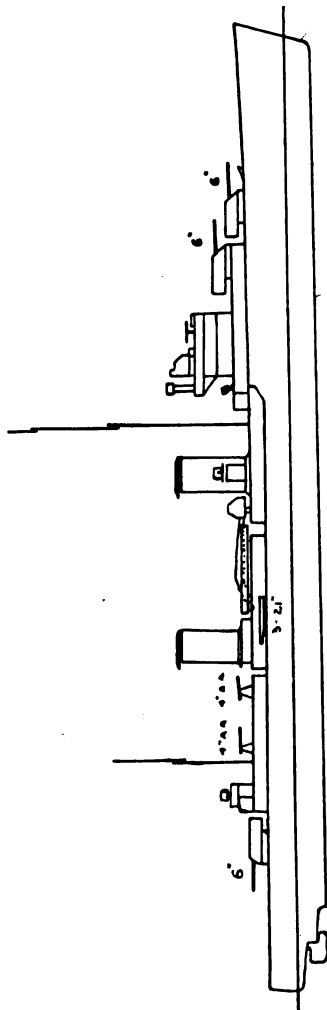
Displacement, 6,895-7,270 tons; Length (extreme), 554 ft. 6 in.; Speed, 32½ knots. Armament, 8-6-in., 8-4-in. A.A., 4-3-pr., 8 torpedo tubes. Masts are now of tripod type. Aircraft removed. Achilles has 6-6-in. and is now H.M.I.S. Delhi. Other three vessels to be scrapped.

GREAT BRITAIN.

CRUISERS.

"*Arethusa*" Class.

Arethusa.



Displacement, 5,220-5,270 tons; Length (extreme), 508 ft.; Speed, 88½ knots; Completed 1905-07.
Armament, 6-6-in.; 8-4-in. A.A.; 9 smaller; 2 triple 21-in. torpedo tubes.

4-in. guns are in twin mountings.

Masts are of tripod type. Aircraft removed.

Aurora is now Chinese ship Chungking.

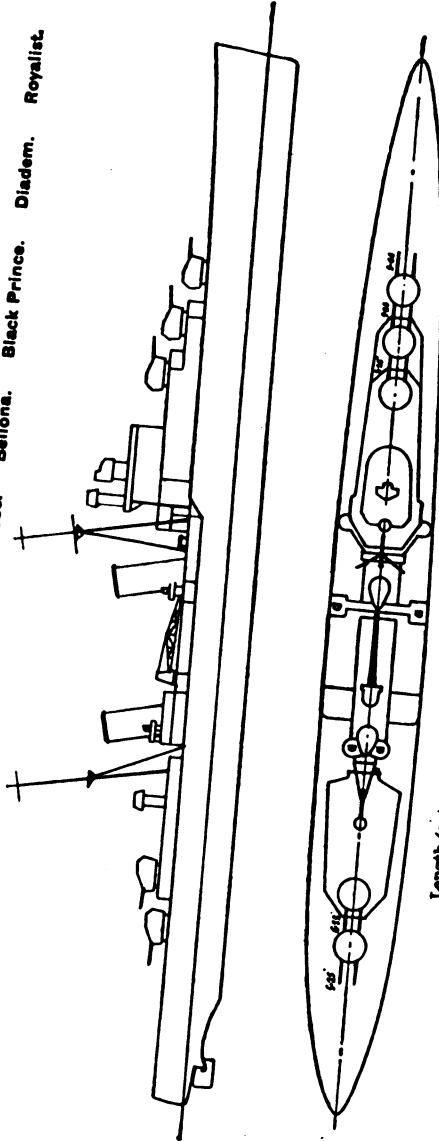
Arethusa to be scrapped.

GREAT BRITAIN.

CRUISERS,

"Dido" Class.

Cleopatra. Dido. Euryalus. Scylla. Sirius. Phoebe. Bellona. Black Prince. Diadem. Royalist.



Length (extreme), 508 ft.; 5,450 tons ; Speed, 33 knots ; Completed, 1941-43.
Armament 8 or 10—5·75-in. ; 6—21-in. torpedo tubes.
Scylla has 8 4·5-in.

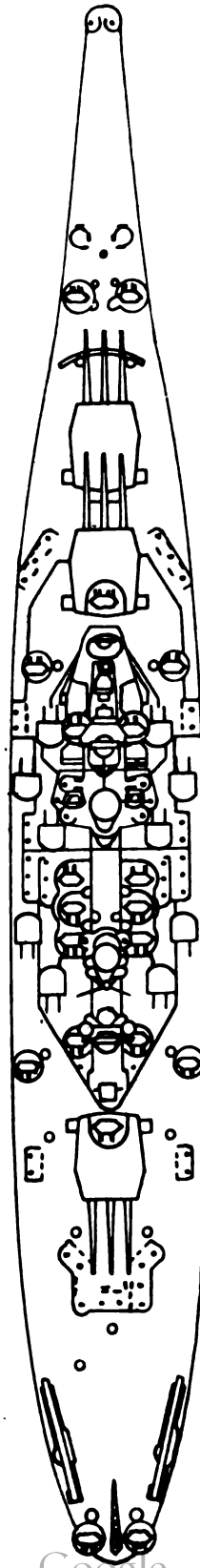
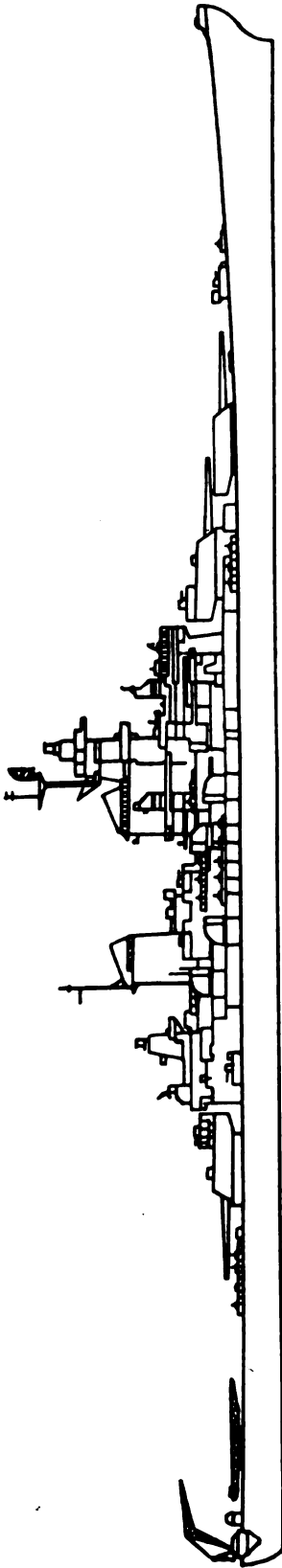
NOTE :—Bellona and Black Prince are serving with Royal New Zealand Navy.

UNITED STATES.

BATTLESHIPS.

"Iowa" Class.

Iowa.	Wisconsin.	Missouri.	New Jersey.	Kentucky.*
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Length, 887½ ft.; Beam 108; Displacement, 45,000 tons; Completed, 1943-44.
 Armament, 9—16-in., 20—6-in.; many 40-m.m. and 20 mm.; 4 Aircraft.

N.B.—The above diagrams are slightly below the true scale.

* Not completed. Will have an armament of rockets in place of guns.

UNITED STATES.

BATTLESHIPS.

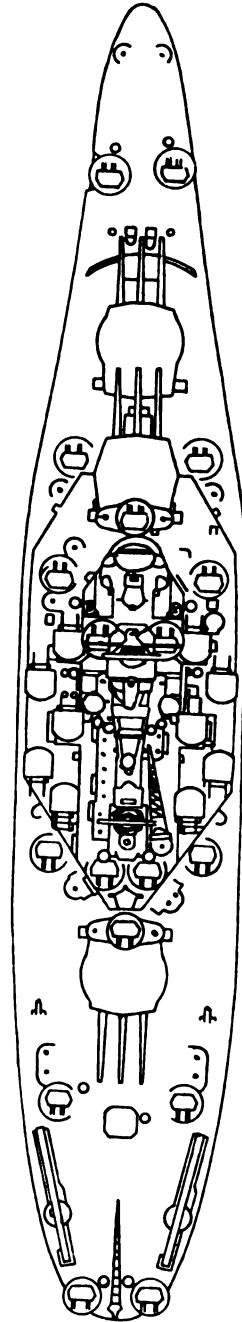
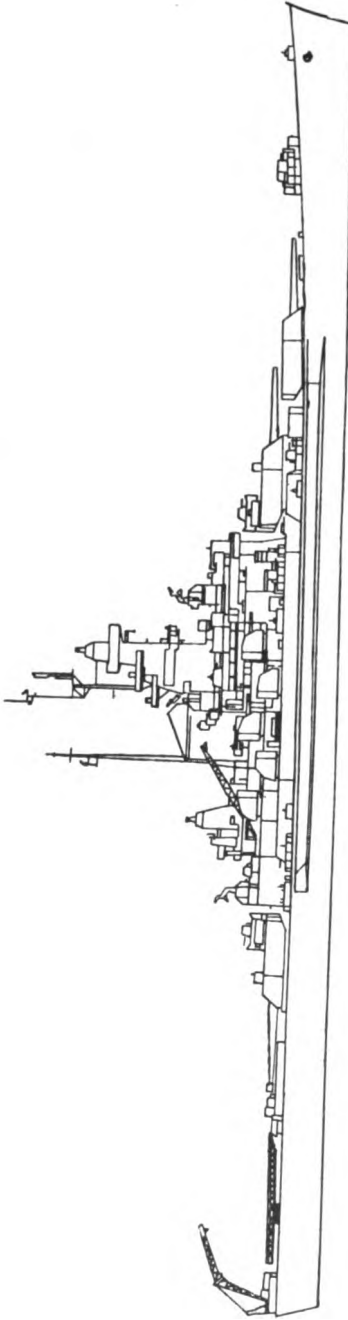
"*South Dakota*" Class.

South Dakota.

Indiana.

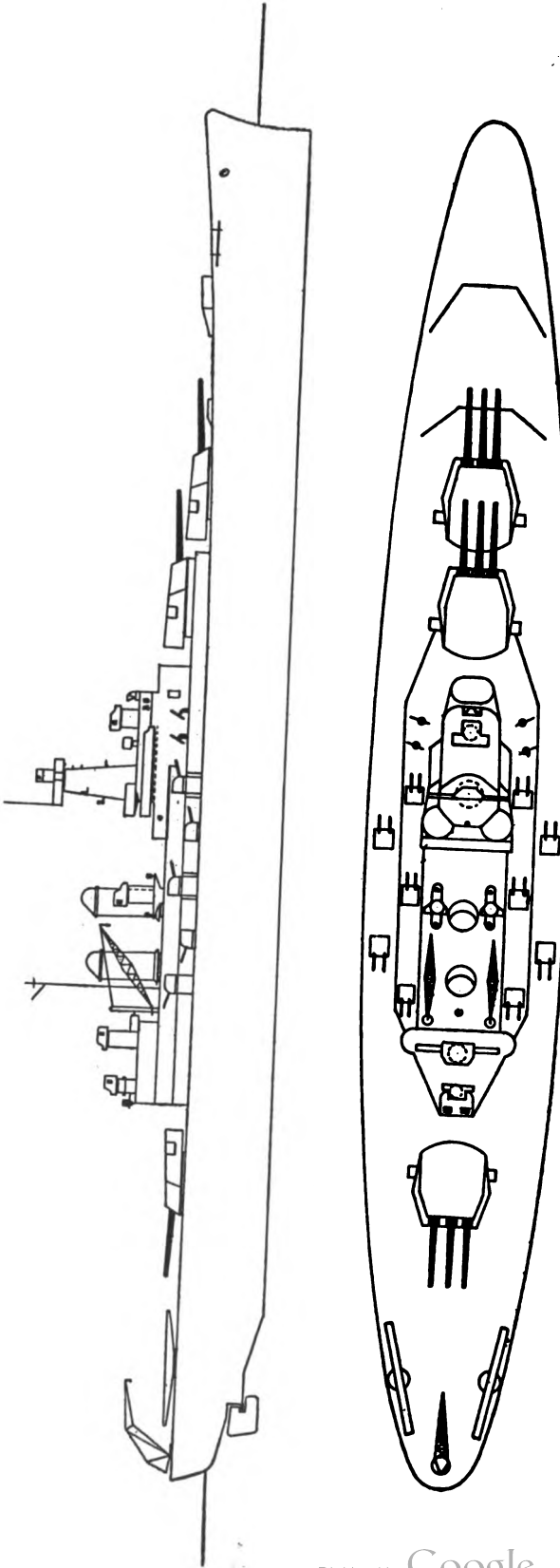
Alabama.

Massachusetts.



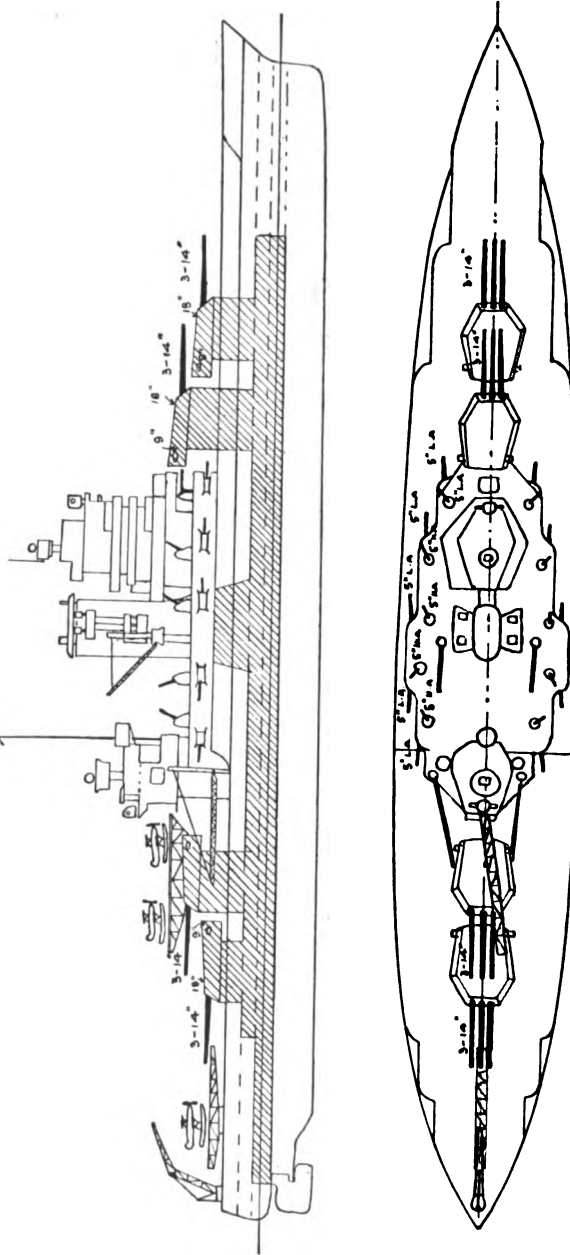
Length, 690 ft.; displacement, 35,000 tons; 27 knots.
Armament, 9—16-in. guns; 20—5-in. (16—5-in. in *South Dakota*); 3 aircraft.

UNITED STATES.
BATTLESHIPS.
"North Carolina" Class.
Washington. North Carolina.



Length, 729 ft.; 35,000 tons; speed, 27 knots. Completed 1941.
Armament, 9-16-in. 20-5-in.; many smaller A.A.; 8 aircraft; 2 catapults.

UNITED STATES.
BATTLESHIPS.
Idaho. New Mexico. Mississippi.
(After modernization 1934.)

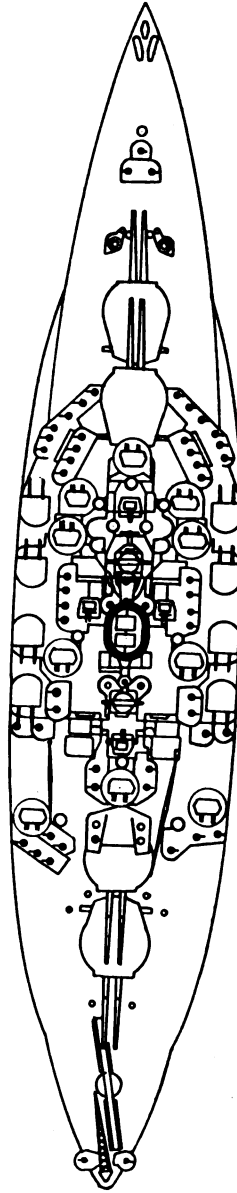
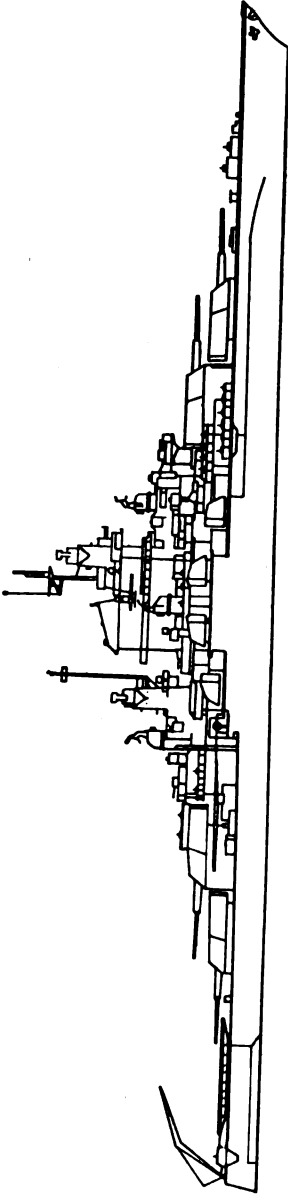


Length (extreme), 624 ft.; Length, W.L., 600 ft.; Speed, 21 knots; 33,400 tons; Idaho and New Mexico, 33,400 tons; Completed, 1917-19. Modernised, 1931-34. Armament, 12-14-in.; 6-8-in.; 8-6-in. A.A.; many small A.A. guns; 2 catapults; 3 seaplanes.

UNITED STATES.

BATTLESHIPS.

Colorado. Maryland. West Virginia.



Length (extreme), 624 ft. ; Length W.L., 600 ft. ; Speed, 21 knots ; 21,500-32,500 tons ; Maryland, completed, 1921 ; Colorado and West Virginia, completed, 1923.
Armament, 8-16-in. ; 12-5-in. ; 8-6-in. A.A. ; many small A.A. guns ; 2 submerged 21-in. torpedo tubes ; 2 catapults ; 3 aircraft.

UNITED STATES.

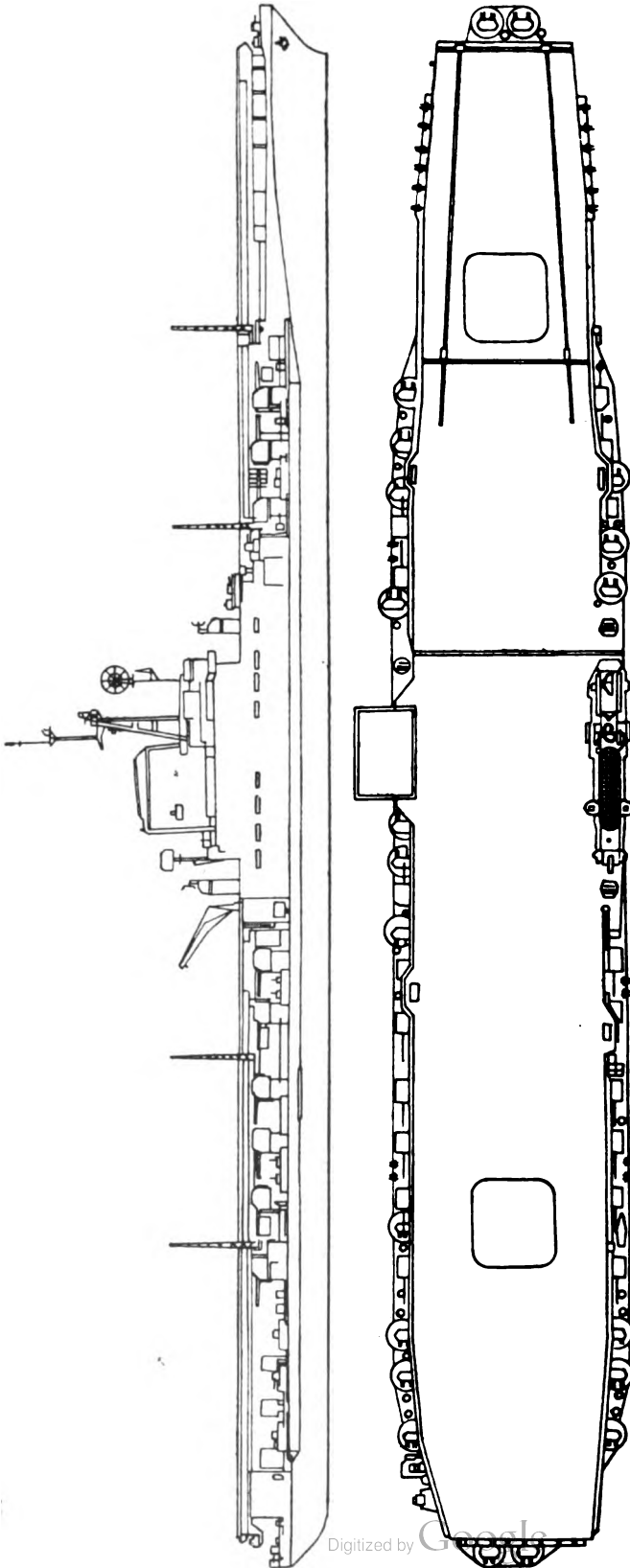
AIRCRAFT CARRIERS.

"Midway" Class.

Midway.

Franklin D. Roosevelt.

Coral Sea.



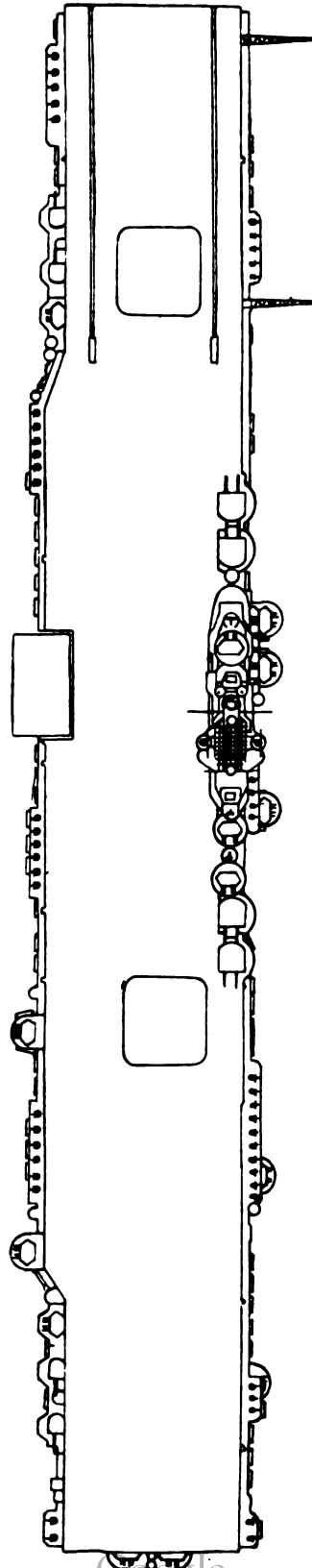
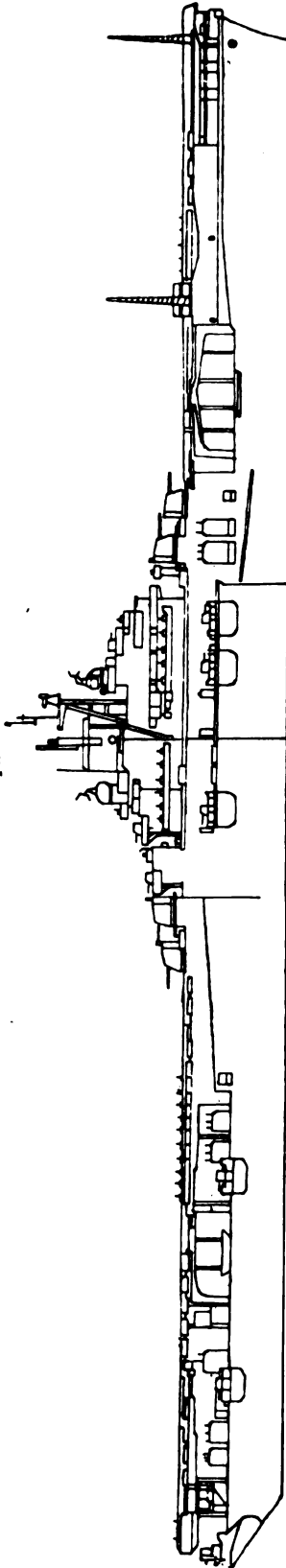
Length, 986 ft.; 45,000 tons; Completed 1946.

Armament, 19-6-in. (single mounts); many smaller.

N.B.—The above diagrams are slightly below the true scale.

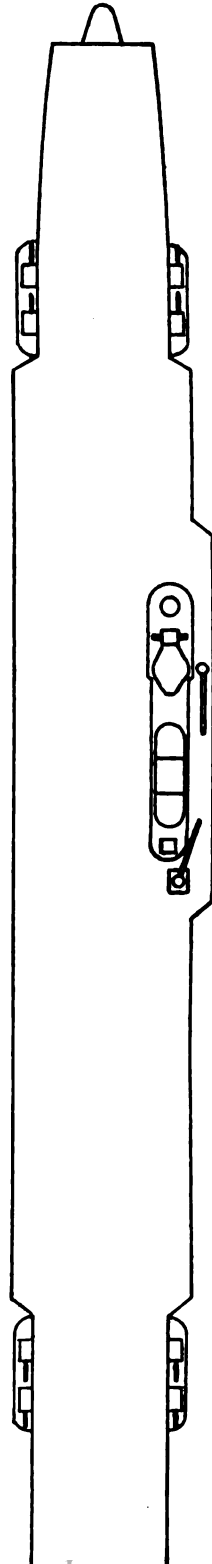
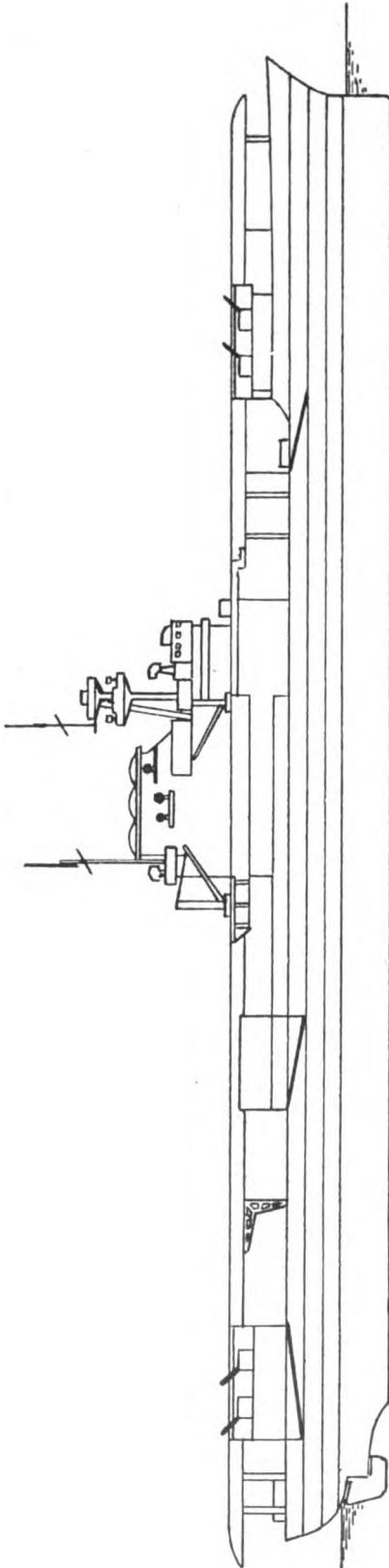
UNITED STATES
AIRCRAFT CARRIERS.
"Eisenstein" Class.

24 ships.



Length, 888 ft. ; 27,100 tons ; Completed 1943-46.
Armament, 12-6-in. ; many 40-m.m. ; about 80 aircraft.
N.B.—The above diagrams are slightly below the true scale.

UNITED STATES.
AIRCRAFT CARRIER.
Enterprise.



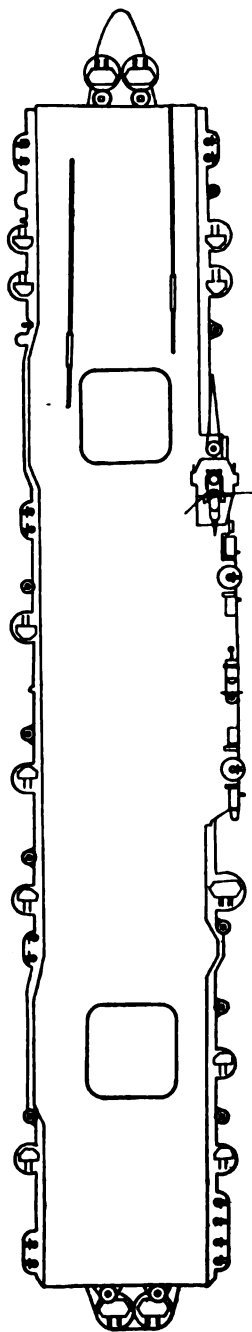
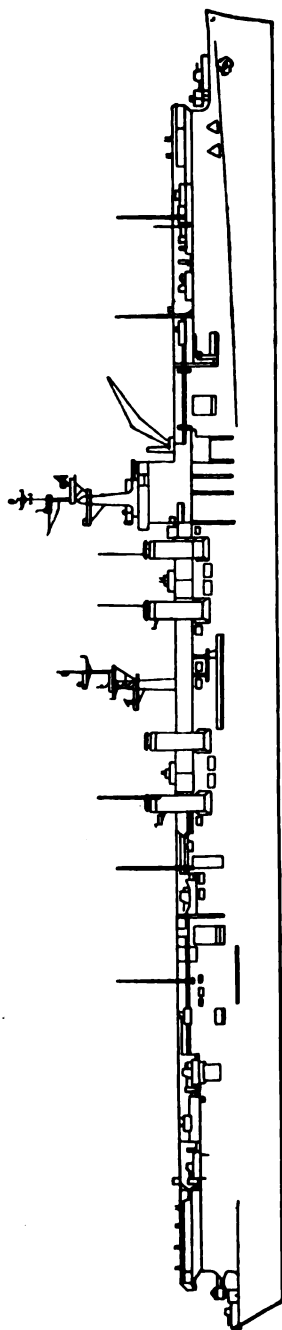
Length (extreme), 804 ft.; 16,900 tons; Speed, 34 knots; completed 1938.
Armament, 8—5-in. A.A.; many small A.A.; 80 aircraft; 1 catapult.

UNITED STATES.

AIRCRAFT CARRIERS.

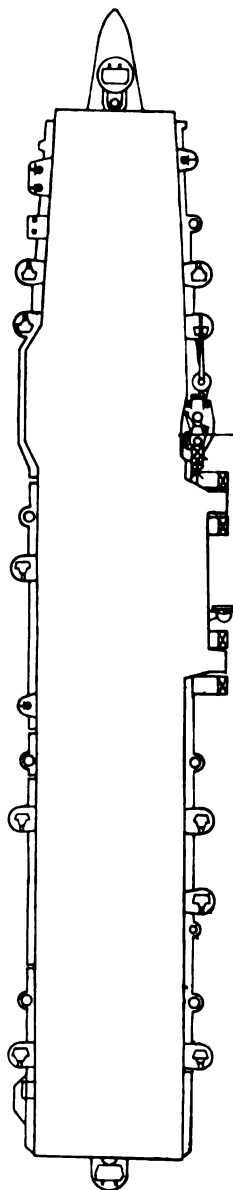
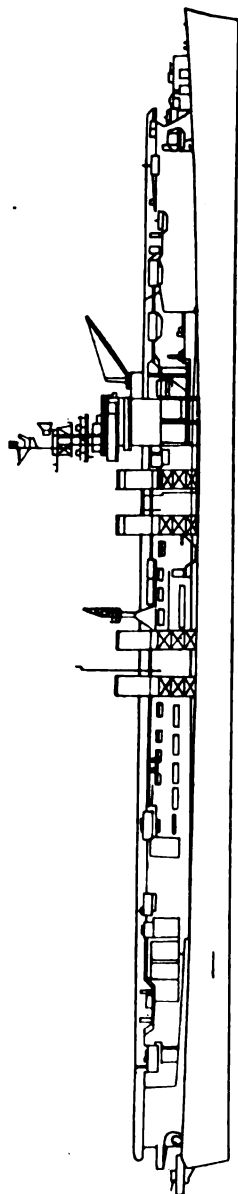
" Saipan " Class.

Saipan. Wright.



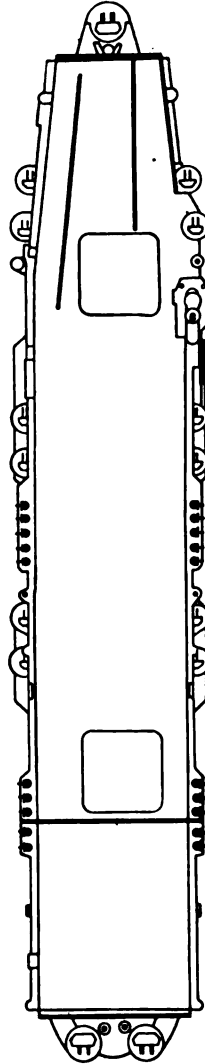
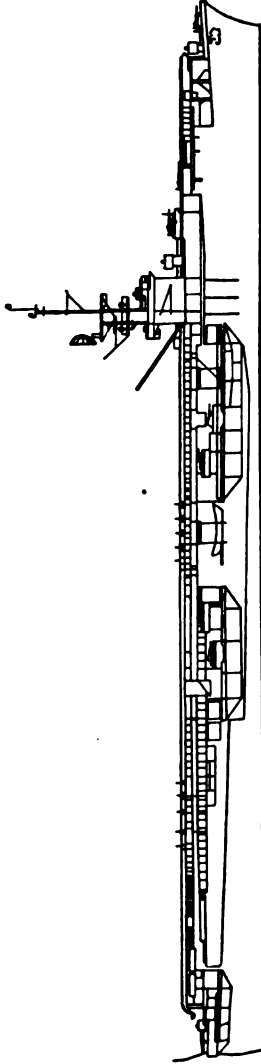
Length, 688 ft. ; displacement, 14,500 tons ; Completed 1945-46.
Armament, many light A.A. guns.

UNITED STATES.
AIRCRAFT CARRIERS.
"Independence" Class.
8 ships.



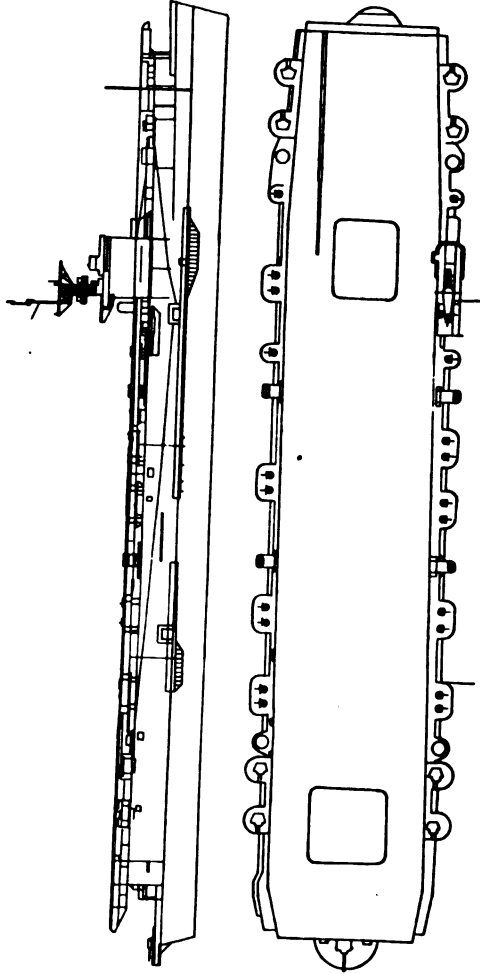
Length, 610 ft.; Displacement, 11,000 tons; Completed 1943.
Armament, many light A.A. guns; 40 m.m. and 20 m.m.

UNITED STATES.
AIRCRAFT CARRIERS.
"Commencement Bay" Class.
19 ships.



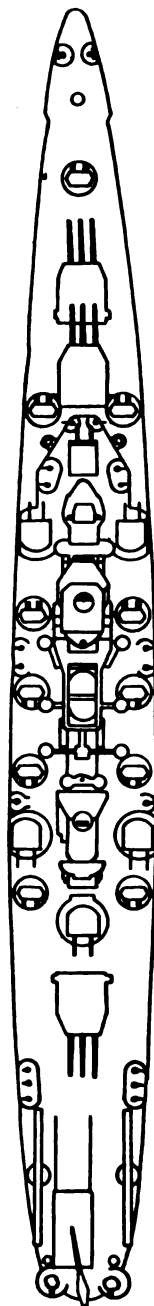
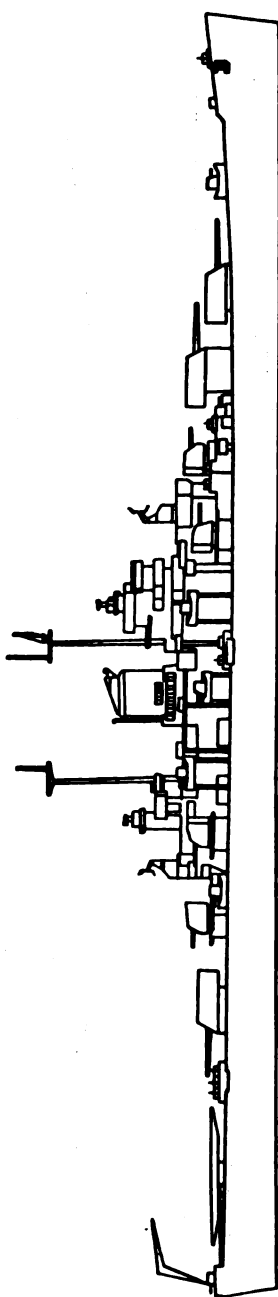
Length, 553 ft.; displacement, 12,000 tons.
Armament, 2-6-in.; many smaller.

UNITED STATES.
AIRCRAFT CARRIERS.
"Casablanca" Class.
45 ships.



Length, 498 ft. 9 in. Displacement 6,780 tons.
Armament, 1—6-in. ; many smaller.

UNITED STATES.
CRUISERS.
"Oregon City" Class.
8 ships.



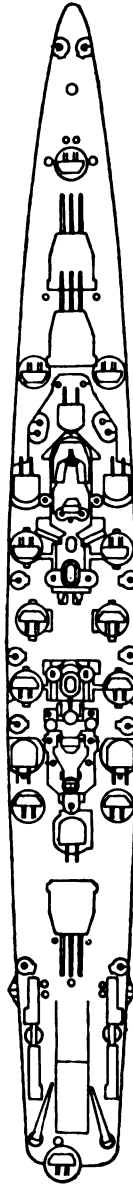
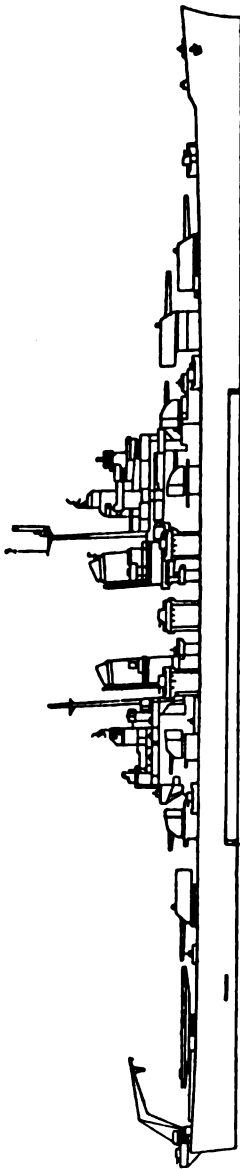
Length, 673½ ft. ; Displacement, 13,600 tons ; 30 knots.
Armament, 9—8-in., 12—5-in. ; many light A.A. guns.
These vessels are single funnel Baltimore.

UNITED STATES.

CRUISERS.

"Baltimore" Class.

14 ships.

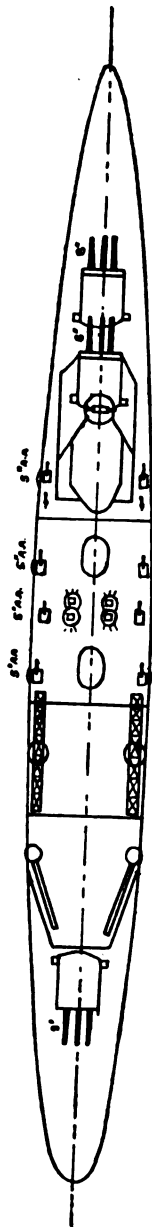
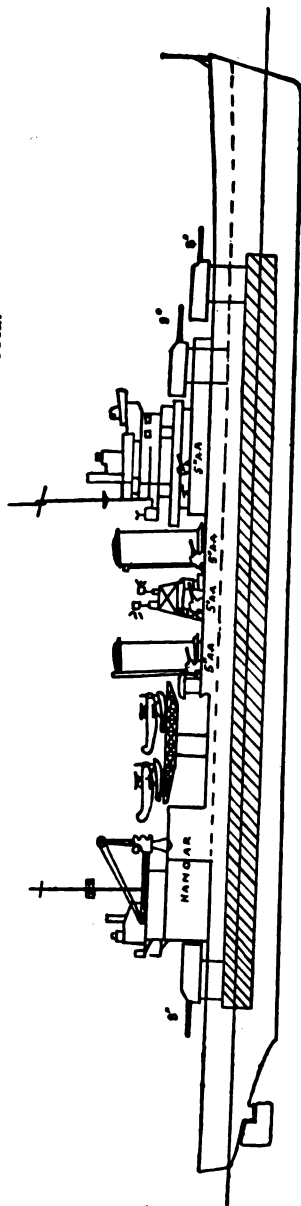


Length, 673½ ft. ; Displacement, 13,600 tons ; 30 knots.
Armament, 9—6-in., 12—6-in. ; many lighter guns.

UNITED STATES.
CRUISERS.

New Orleans Class.

New Orleans. San Francisco. Minneapolis. Tuscaloosa.



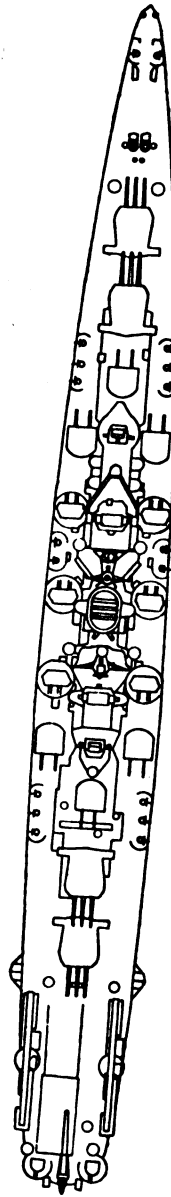
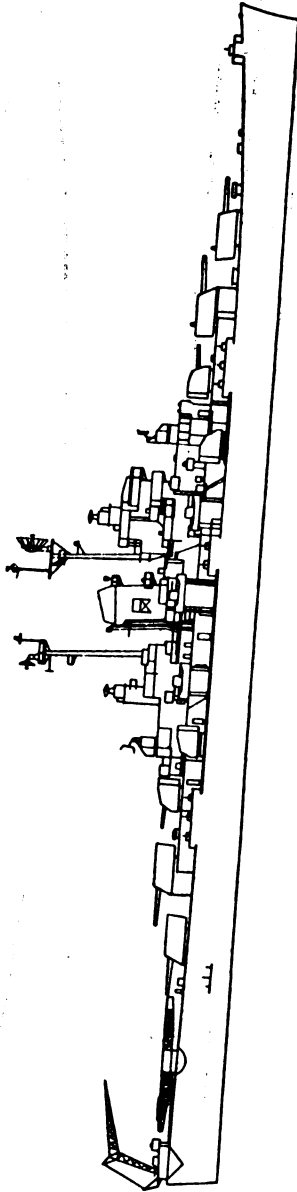
Length (extreme), 588 ft.; on W.L., 574 ft.; 9,960 tons; Speed, 32.7 knots; Completed, 1924-26.
Armament, 9-8-in., 8-6-in.; many small A.A. guns; 2 catapults; 4 aircraft.

UNITED STATES.

CRUISERS.

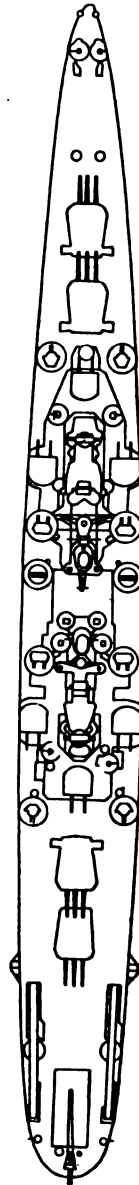
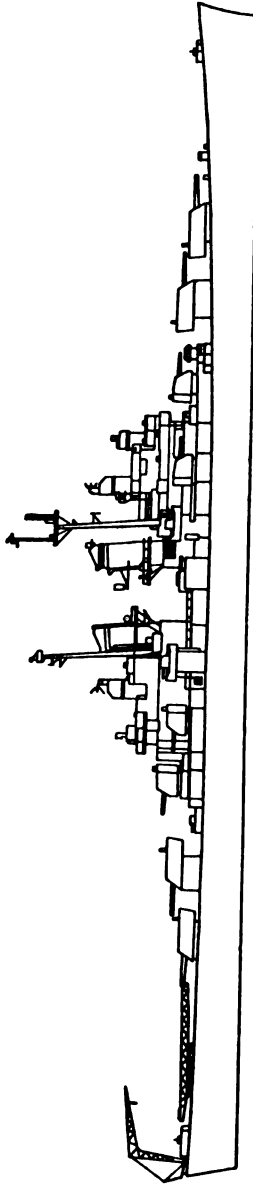
"Fargo" Class.

3 ships.



Length, 608 ft. ; Displacement, 10,000 tons ; Completed 1945-46.
Armament, 12-6-in. ; 12-5-in. ; many smaller A.A. ; 4 aircraft.
These vessels are single funnel Clevelanda.

UNITED STATES.
CRUISERS.
"Cleveland" Class
26 ships.



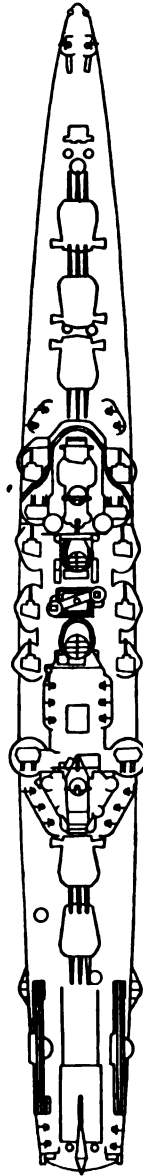
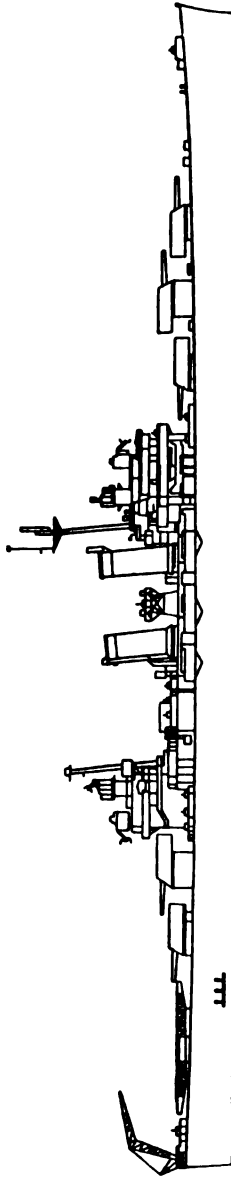
Length, 608 ft. ; Displacement, 10,000 tons; Completed 1942-46.
Armament, 12—6-in., 12—5-in. ; many smaller ; 4 aircraft.

UNITED STATES.

CRUISERS.

"*Brooklyn*" Class.

8 ships.

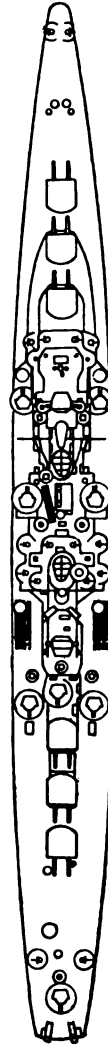
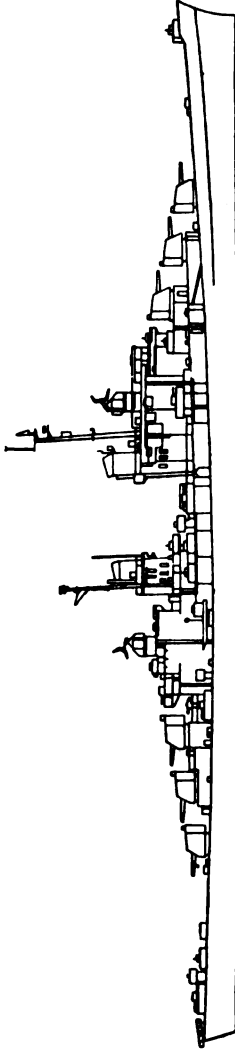


Length, 608 ft. ; Displacement, 9,700 tons ; Completed 1938.
Armament 15-0 in. 8-5-in. ; many smaller ; 4 aircraft.

UNITED STATES.
CRUISERS.

"San Diego" and "Oakland" Classes.

9 ships.

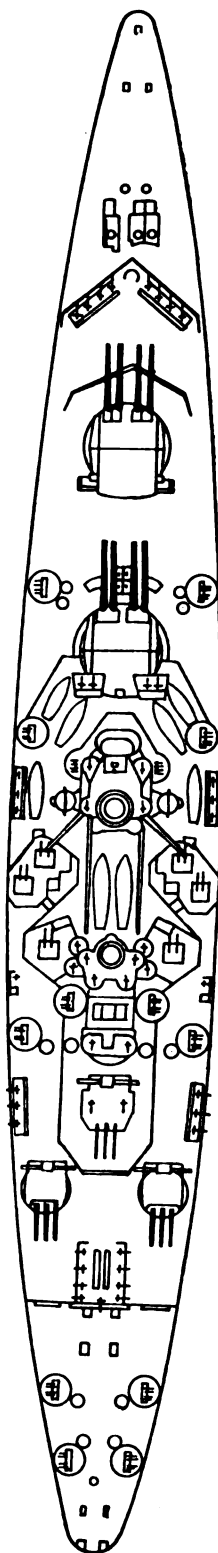
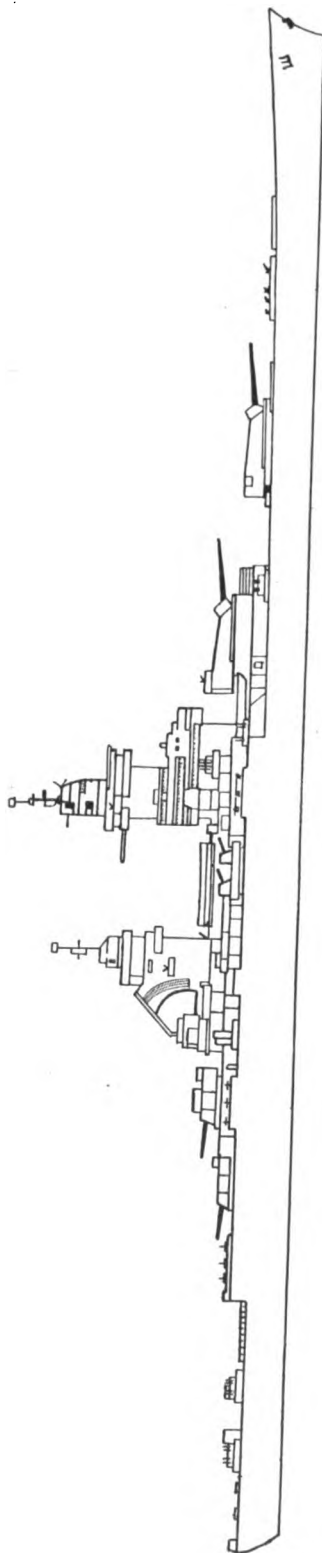


Length, 541 ft. ; Displacement, 6,000 tons ; Completed 1942-46.
Armament, 12 or 16—5-in. ; many smaller.

FRANCE.

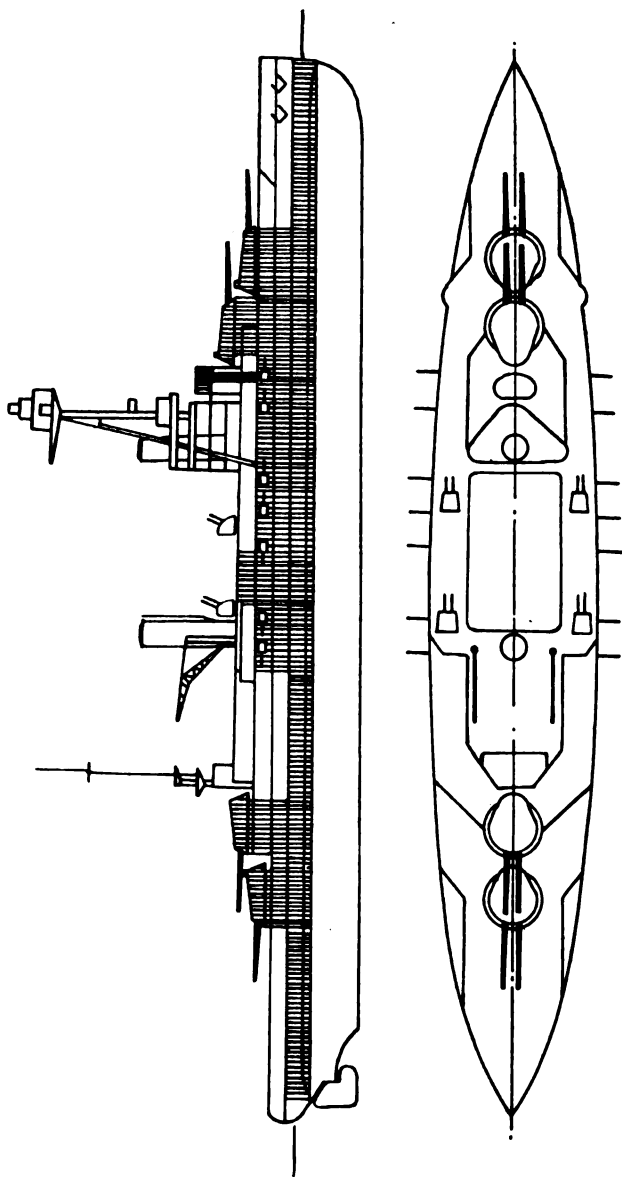
BATTLESHIPS.

Richelieu. Jean Bart.



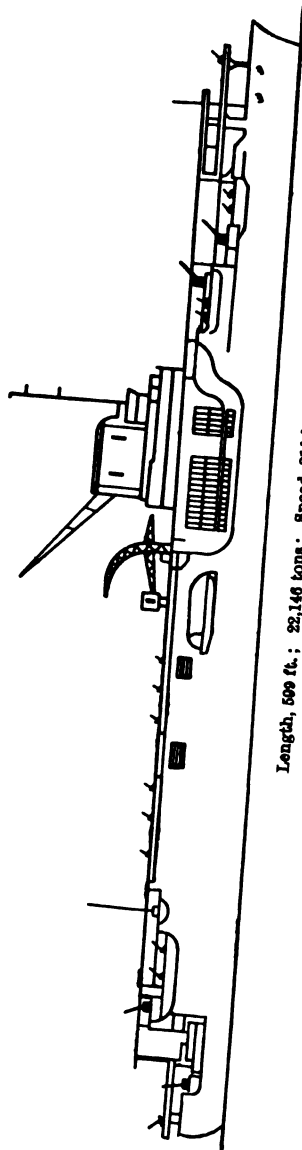
Length, 794 ft. ; 35,000 tons ; Speed, 31 knots, approx.
 Armament, 8—15-in. ; 9—6-in. ; 12—3-in. A.A. ; 67—40-m.m. A.A. ; 39—20-m.m. A.A.
 Jean Bart will have a different close range armament.

FRANCE.
BATTLESHIP.
Lorraine.



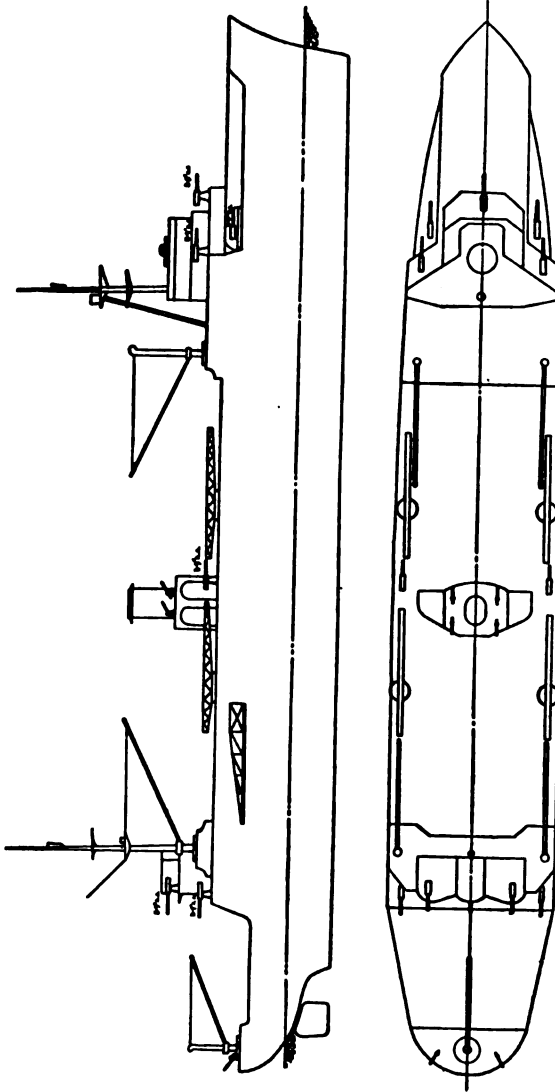
*Length (extreme), 544 ft. 6 ins. ; 22,139 tons ; Speed, 21 knots.
Armament, 10—13-4-in. ; 14—5-4-in. ; 8—3-in. A.A. Many smaller.
Employed on training duties.*

FRANCE.
AIRCRAFT TRANSPORT-
Béarn.



Length, 509 ft. ; 22,146 tons ; Speed, 21½ knots.
Armament, 4-6-in. A.A. ; 28-20-mm. A.A.

FRANCE.
AVIATION TRANSPORT.
Commandant Teste.

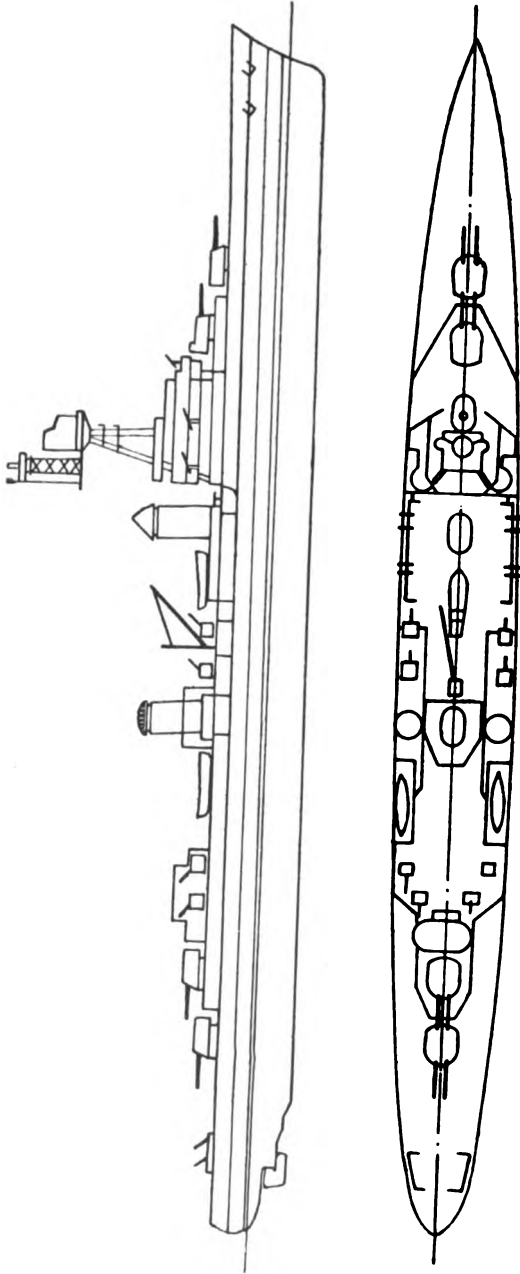


Length (extreme), 548 ft. ; 10,000 tons Speed, 20½ knots; Completed, 1932.
Armament, 12-8½-in. A.A. ; 8-3-pr. A.A. ; 12 M. ; 19 planes.

FRANCE.

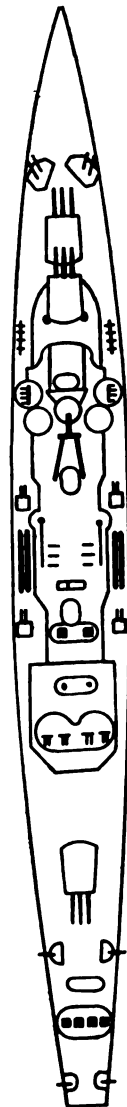
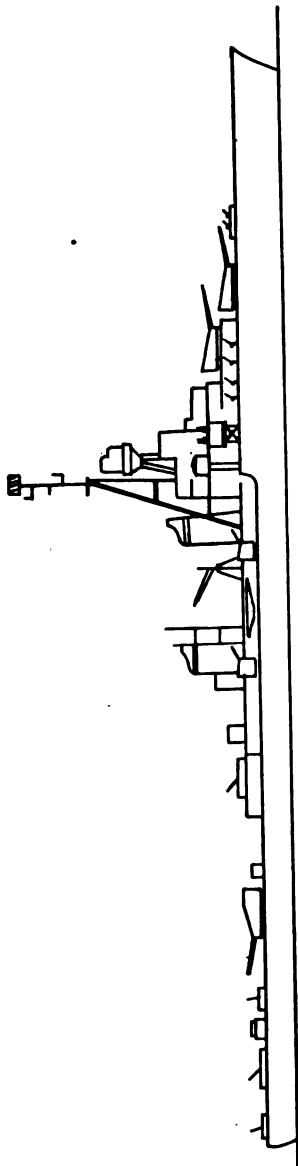
CRUISERS.

Duquesne. Tourville. ("Duquesne" Class.) Suffren.



Length, 648 ft; 10,000 tons; Speed, 32 knots (Duquesne and Tourville, 33.2 knots).
Armament, 8—8-in., 8—3-in. A.A., 8—1.6-in. A.A.

FRANCE.
CRUISERS.
Gloire. Montcalm. Georges Leygues.

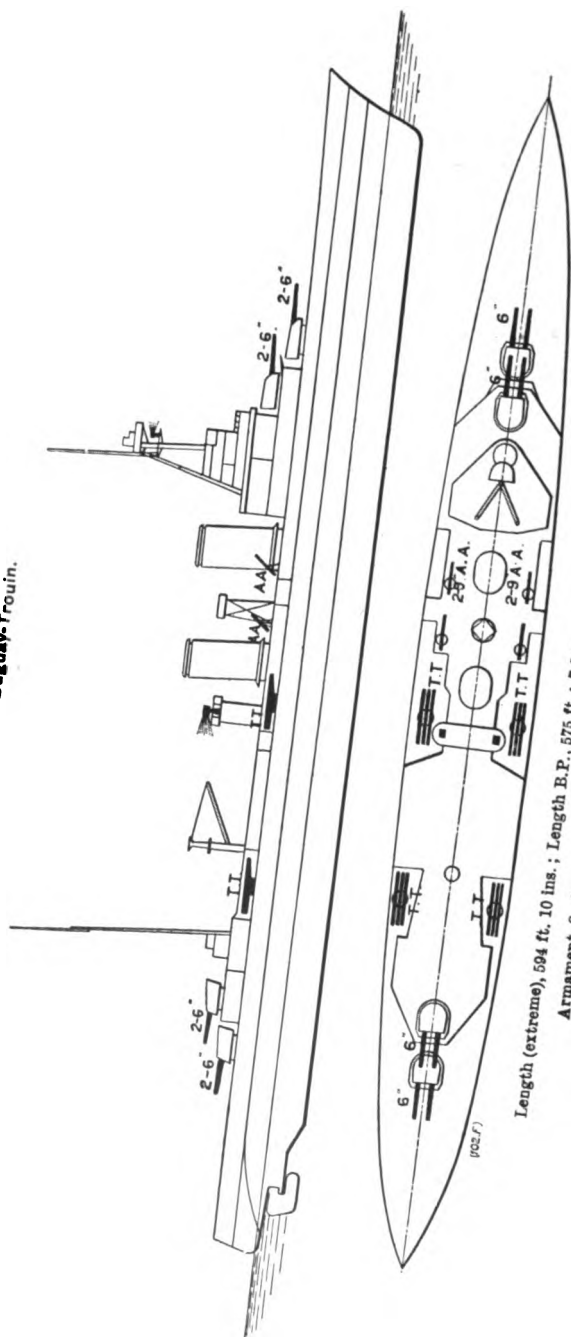


Length (extreme), 589 ft.; 7,600 tons; Completed, 1935-37; Speed, 31 knots.
Armament, 9—6-in.; 8—8.6-in. A.A.; 24—40-mm. A.A.; 16—20-mm. A.A.

FRANCE.

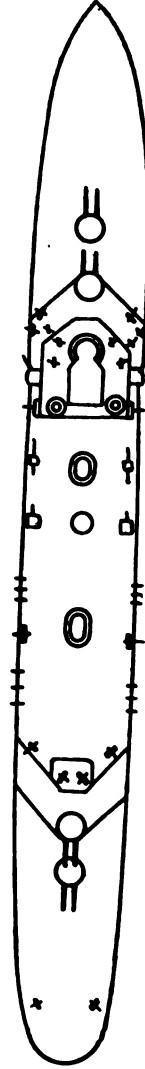
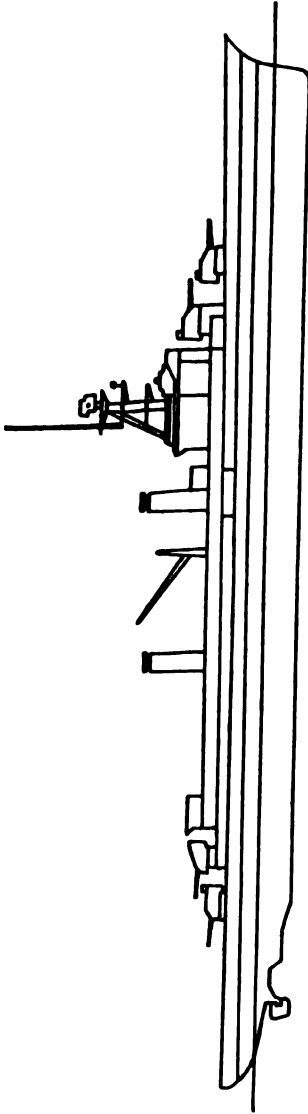
CRUISER.

Duguay-Trouin.



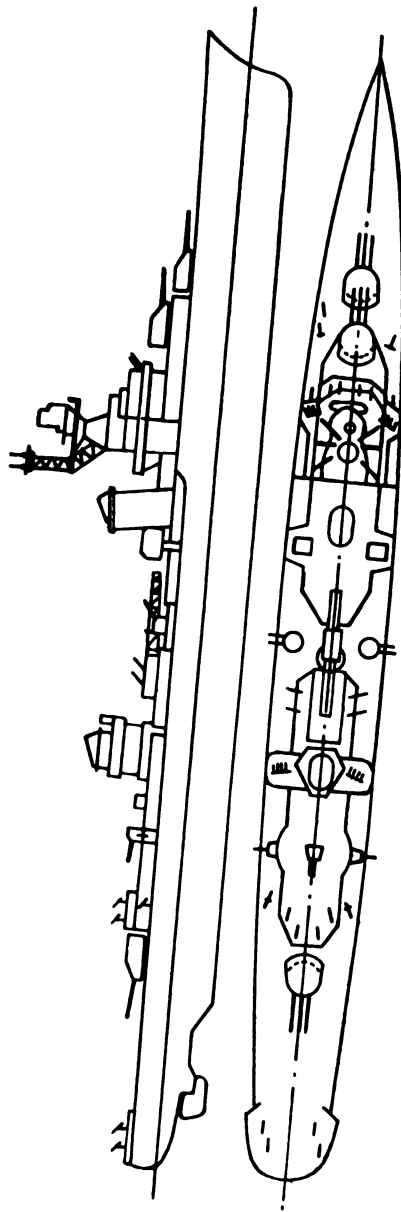
Length (extreme), 594 ft. 10 ins.; Length R.P., 575 ft.; 7,249 tons; Speed, 24 knots. Completed, 1923.
 Armament, 8-9.1-in.; 4-8-in. A.A.; 6-40-mm. A.A. 22-20-mm. A.A.

FRANCE.
TRAINING CRUISER.
Jeanne d'Arc.



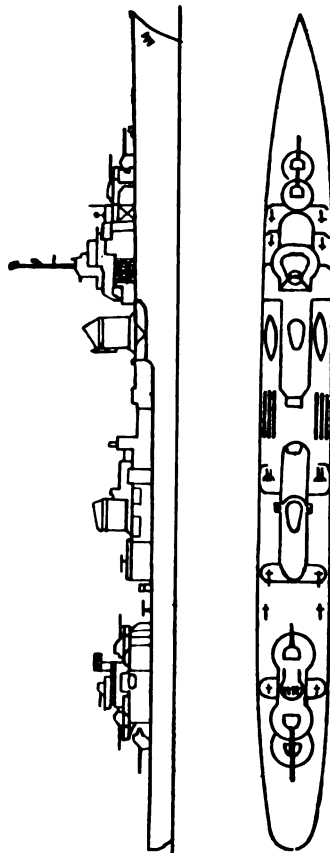
Length, 557 ft. 9 ins.; 6,406 tons; Speed, 26 knots.
Armament, 8—6.1-in.; 4—8-in. A.A.; 14—40-mm. A.A.; 20—20-mm. A.A.

FRANCE.
CRUISER MINELAYER.
Emile Bertin.

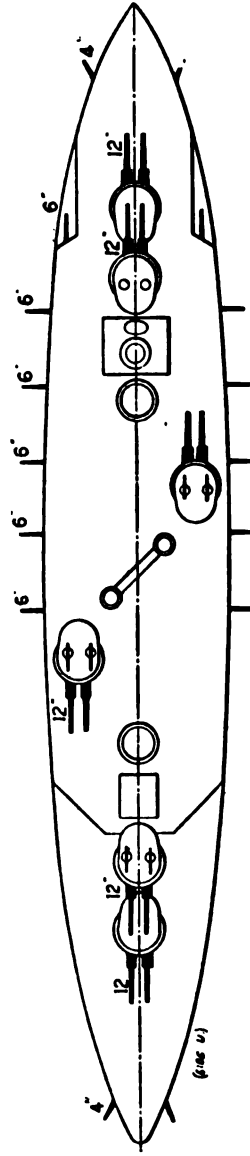
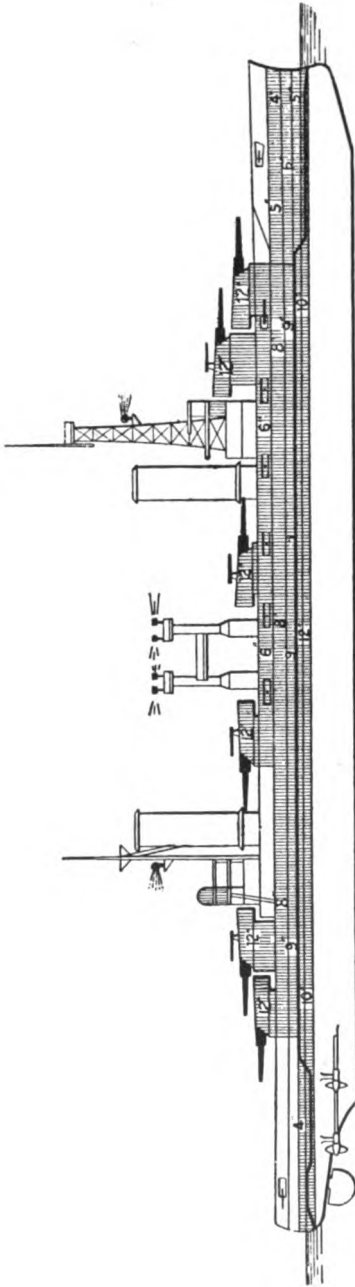


Length, 580 ft. 9 in.; 5,383 tons; Speed, 34 knots.
Armament, 9—6-in.; 8—3.5-in. A.A. Others smaller.

FRANCE.
LIGHT CRUISERS.
Le Fantasque. Le Malin. Le Terrible. Le Triomphant.



Length, 434 ft. 6 ins.; 2,560 tons; Speed, 37 knots.
Armament, 8—5.4-in.; 8—40-mm. A.A.; 10—20-mm. A.A.; 6—21-in. T.T.

ARGENTINA.**BATTLESHIPS.****Moreno.****Rivadavia.**

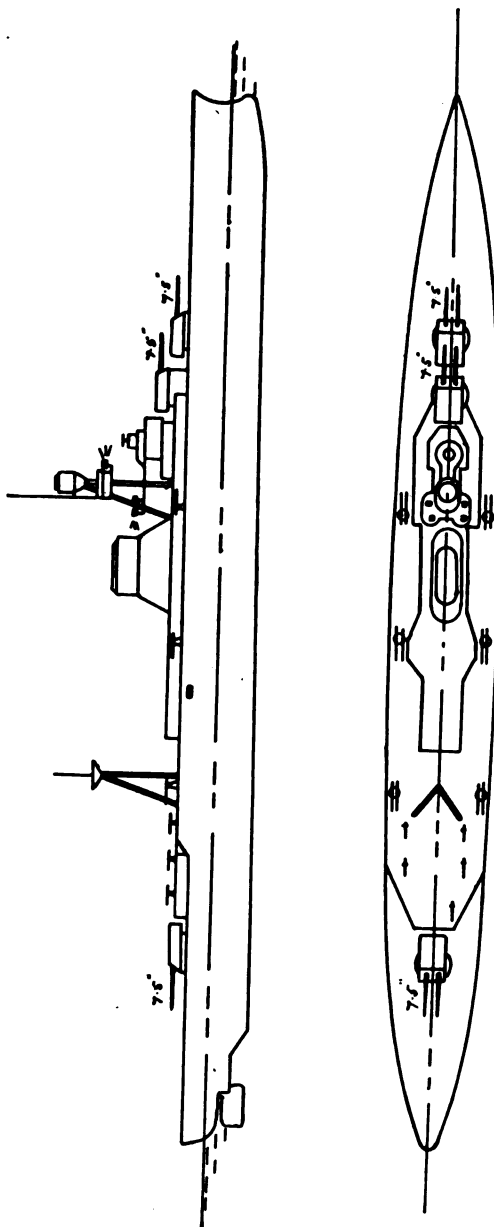
Length (extreme), 533 ft. ; Length on W. L., 575 ft. ; Speed, 32½ knots ; Completed, 1914-15.
 Armament, 12-12-in. ; 12-6-in. ; 4-3-in. A.A. ; 4 M. ; 4 L. ; 3 submerged 21-in. torpedo tubes.
 8-pdr. guns on B and X turrets replaced by rangefinders.
 Derricks fitted to midship tower.

ARGENTINA.

CRUISERS.

Almirante Brown.

Vinticino de Mayo.

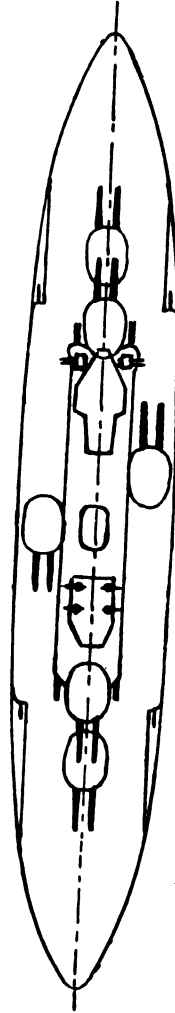
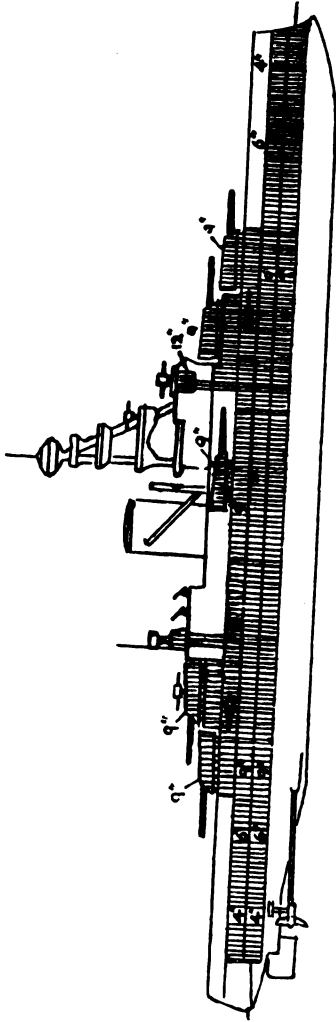


Length (extreme), 544½ ft. ; 6,495 tons ; Speed, 32 knots. Completed, 1931.
 Armament, 6—7½-in. ; 12—4-in. A.A. ; 6 Pom Poms ; 6—21-in. torpedo tubes,
 1 catapult ; 3 seaplanes.

Corrections to plan.—Derrick fitted on fore side of mainmast. Superstructure built aft side of mainmast.

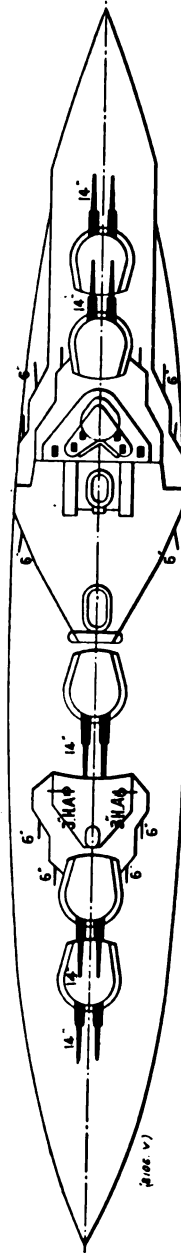
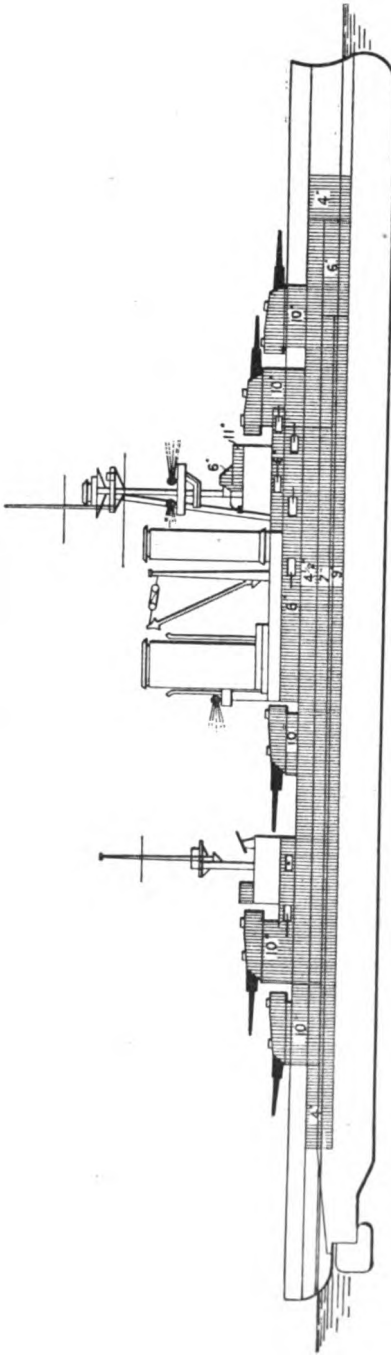
BRAZIL.
BATTLESHIPS.
Minas Geraes.

São Paulo.



Length (extreme), 641 ft. ; Length B.P., 500 ft. ; 19,200 tons ; Speed, 21 knots ; Completed, 1909, 1910.
Armament, 14—12-in. ; 2—4.7-in. ; 2—3-pr. ; 4—3-in. A.A. ; 8 M. A.A.

CHILE.
BATTLESHIP.
Almirante Latorre (formerly H.M.S. Canada).

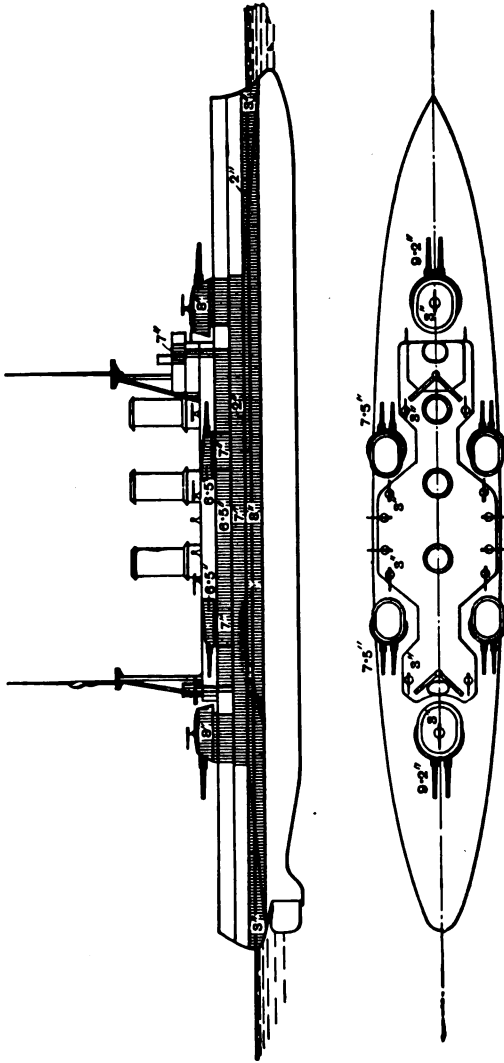


Length (extreme), 601 ft. ; Length B.P., 625 ft. ; Standard Displacement, 28,950 tons ; Speed, 23 knots ; Completed, 1918 ; Modernised at Devonport Dockyard, 1929-31.
Armament, 10—14-in. ; 14—6-in. ; 4—4-in. A.A. ; 4—1.8-in. ; 4 submerged 21-in. torpedo tubes ; 1 catapult.
• During modernisation main topmast has been raised and bridge platform extended.
Catapult fitted on quarter deck.

GREECE.

ARMoured CRUISER.

Giorgios Averoff.



Yard No. 1697: 0 801 tons: Speed, 22.5 knots: Completed, 1911. Redited, 1927.

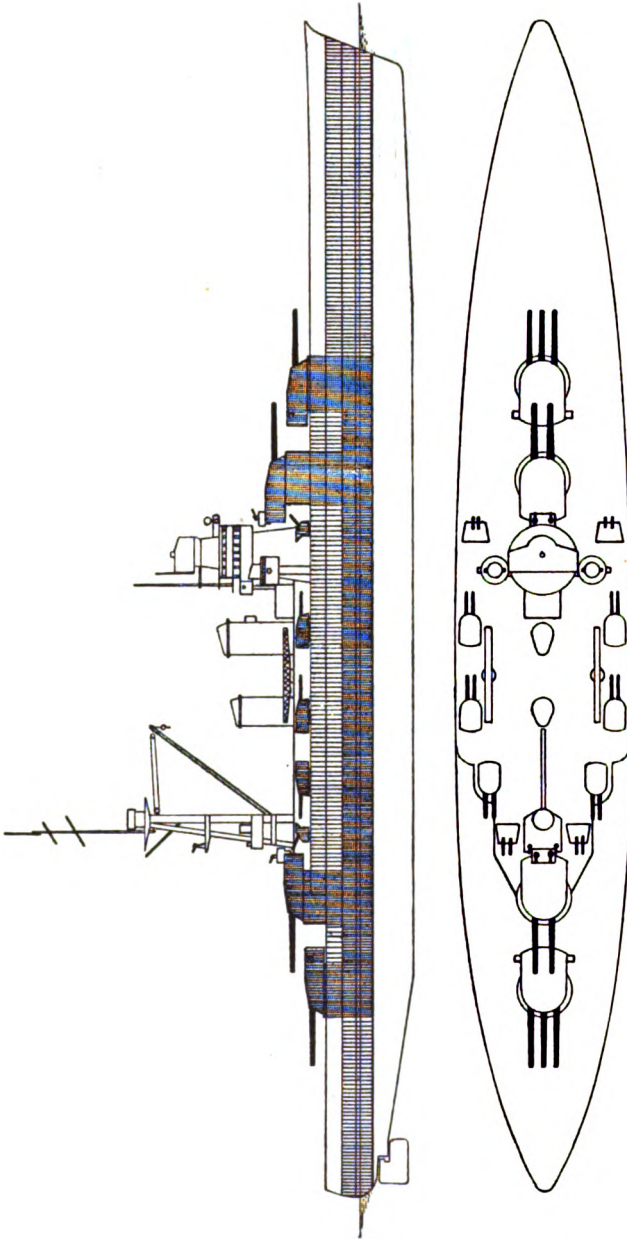
Length, 463 ft.; 9,801 tons; speed, 22.5 knots; complement, 1,000.
 Armament, 4-9.2-in.; 8-7.5-in.; 16-3-in. A.A.; 4-8-pr.; 2 M.; 8 submerged 18-in. torpedo tubes.
 Correction to plan.—Bridgework modified. Control top fitted on foremast. Searchlight and derrick fitted to mainmast.
 Now used as depot ship. To be scrapped.

ITALY.

BATTLESHIPS.

Andrea Doria. Caio Dullio.

(After modernisation.)



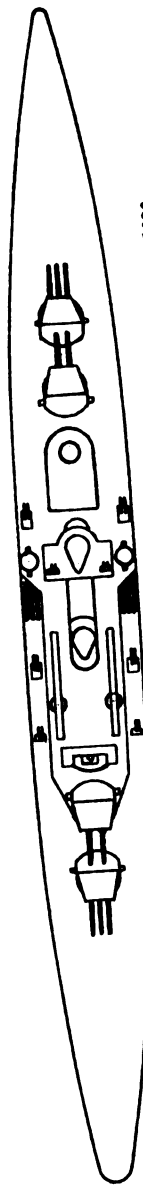
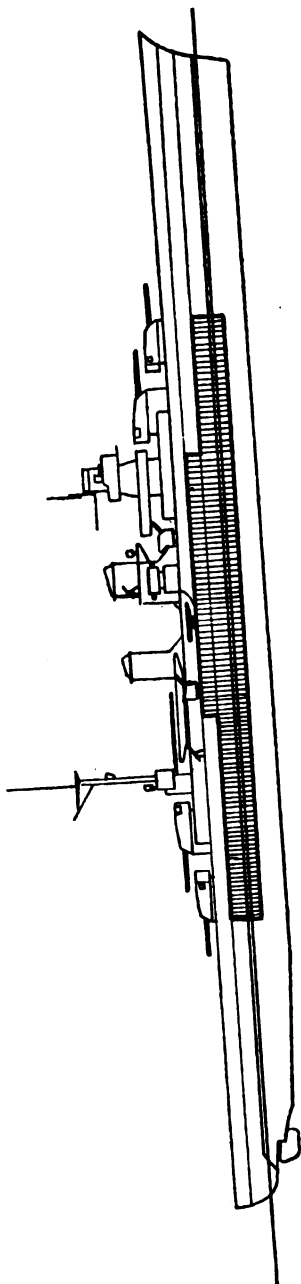
Length (extreme), 611 ft. 6 in. ; 23,622 tons ; 27 knots ; Completed, 1914-15 ; Modernised, 1937.
 Armament { 10—12·6-in. ; 12—4·7-in. ; 8—3·9-in. A.A. ; 36 A.A. M.G. ; 4 aircraft ; 2 catapults in Cesare.
 { 10—12·6-in. ; 12—5·3 in. ; 10—3·5 in. A.A. ; 39 A.A. M.G. ; 1 aircraft ; 1 catapult in Doria and Dullio.
 Doria and Dullio have a modified bridge structure and a different arrangement of A.A. guns.
 Giulio Cesare of this class ceded to U.S.S.R.

ITALY.

CRUISERS.

Giuseppe Garibaldi.

Luigi di Savoia.

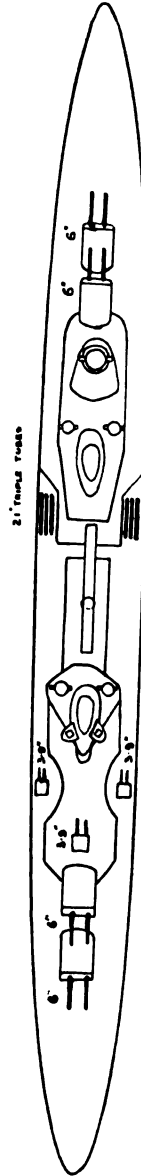
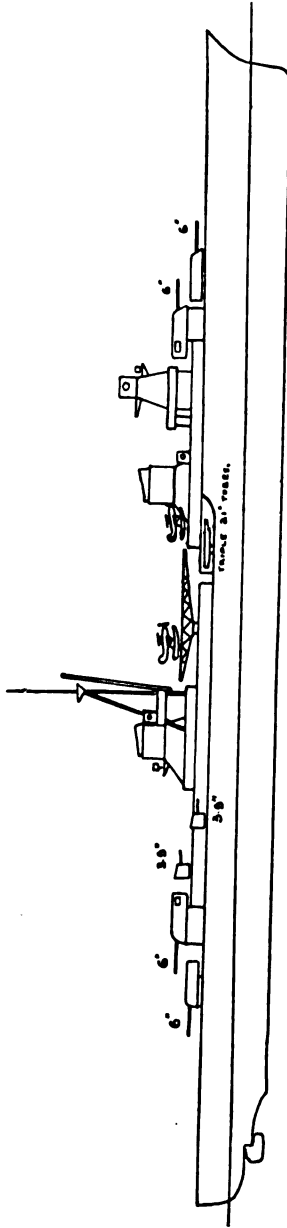


Length (extreme), 613 ft. 9 in.; Standard displacement, 7874 tons; Speed, 35 knots; Completed, 1936.
Armament, 10—6 in.; 8—3-9 in. A.A.; 8—1-5 in. A.A.; 6—21 in. torpedo tubes; 2 catapults; 4 aircraft.

GREECE.
CRUISER.

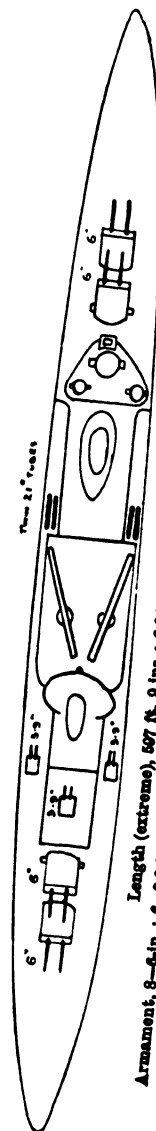
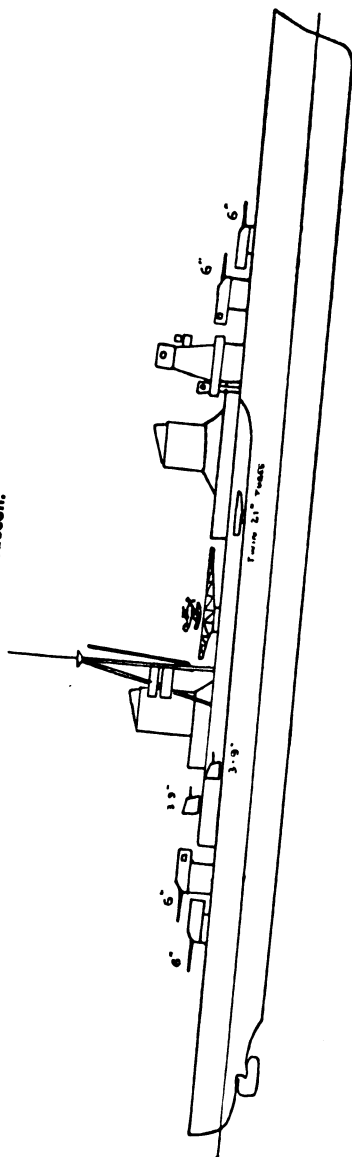
"Atendolo" Class.

Ez-Italian Eugenio di Savoia.



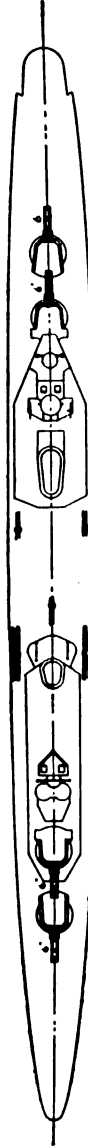
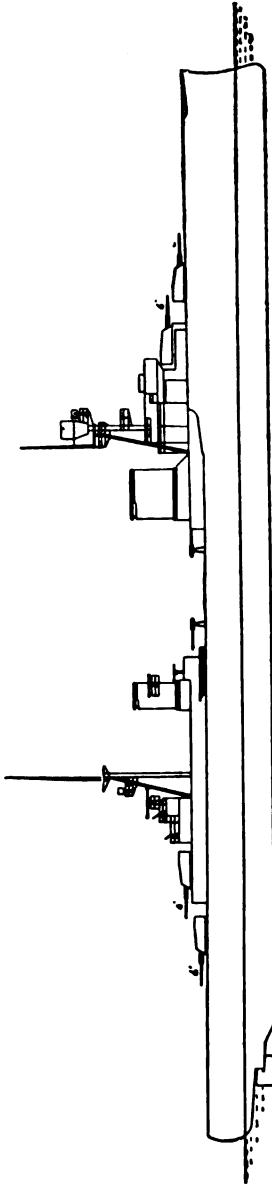
Length (extreme), 610 ft. 3 in. ; 7,283 tons ; Speed, 36½ knots.
Armament, 8—6-in. ; 8—8-in. A.A. ; 8—6-in. A.A. ; 2 triple 21-in. torpedo tubes ; 1 catapult ; 3 aircraft.
Filliberto Duca d'Aosta of this class ceded to U.S.S.R.

ITALY.
CRUISER,
Montecuccoli.



Length (extreme), 507 ft. 9 ins. ; 6,941 tons ; Speed, 37 knots ; Completed, 1908.
Armament, 8-6-in. ; 6-8-2-in. A.A. ; 8-1-2-in. A.A. ; 8-6-in. A.A. M.G. ; 2 twin 21-in. torpedo tubes ; 1 catapult ; 3 aircraft.
Correction to plan.—1 catapult fitted on M.L.

ITALY.
CRUISER.
Luigi Cadorna.



Length (extreme), 554 ft. 6 ins., 5,008 tons ; Speed, 37 knots ; Completed, 1903.
Armament, 8—6-in. ; 6—3.9-in. A.A. ; 8—1.9-in. A.A. ; 8—5 in. A.A. M.G. ; 4 torpedo tubes 21-in. ;
1 catapult and 2 seaplanes.

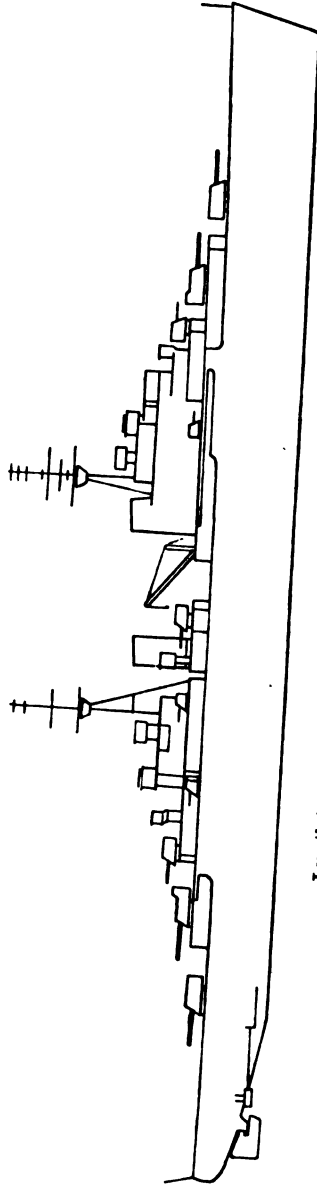
Corrections to plan : The bridge and foremast have been modified. The after twin 3.9-in. A.A. gun is at the superstructure level on a raised platform.
Derrick fitted on foremast, which has been moved forward of after funnel.

Torpedo tubes are abreast forward funnel.

NETHERLANDS.
CRUISERS.

De Ruyter.

De Zeven Provinciën.



Length (overall) 614½ ft.; 8,350 tons standard (designed); 33 knots.
Armament, 8—6-in.; 8—57-mm. 8—40-mm.; 6—21-in. torpedo tubes. Should complete in 1960.

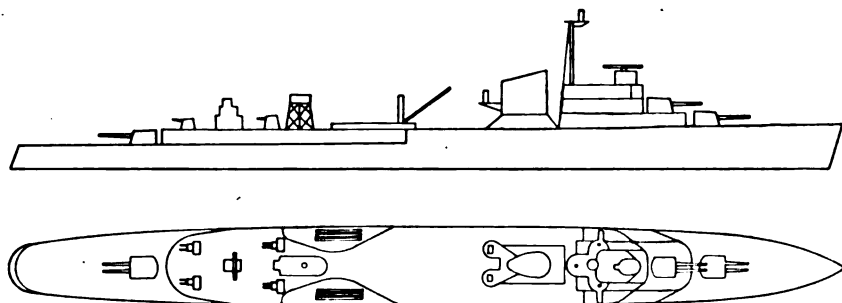
NOTE.—Shape of bow differs between the vessels.

NETHERLANDS.

LIGHT CRUISERS.

Tromp.

Heemskerck.



Length, 433 ft. ; Displacement, 3,350 tons ; Completed 1938.

Armament, 6—5-9-in. ; many smaller in Tromp.

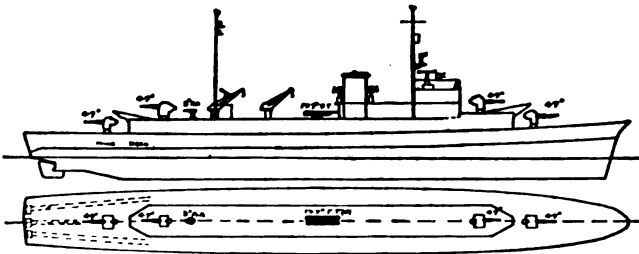
10—4-in., many smaller in Jacob van Heemskerck.

Heemskerck was completed in U.K., appearance is different.

NORWAY.

MINELAYER AND TRAINING SHIP.

Olav Trygvason.



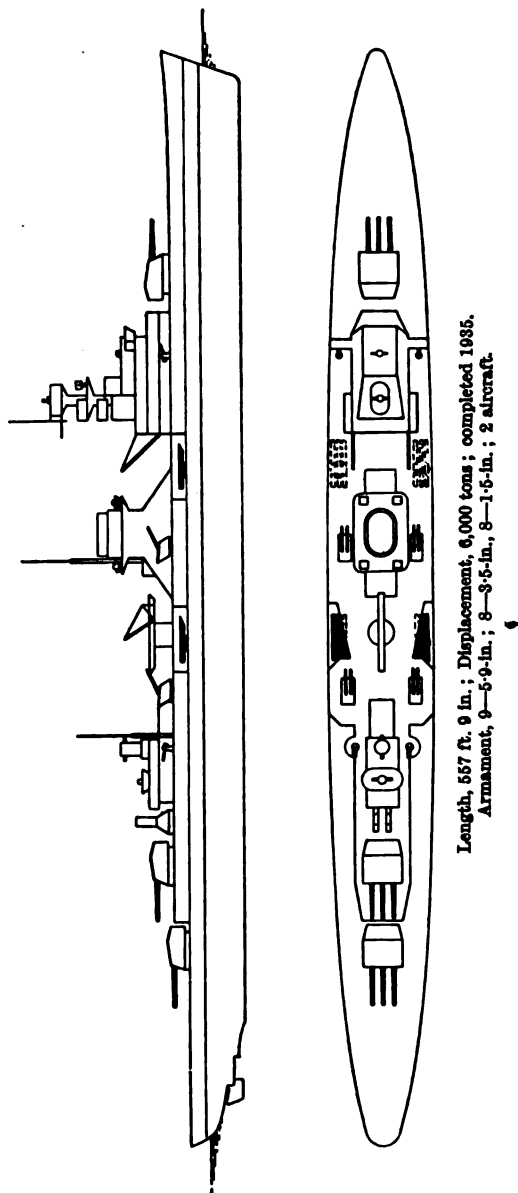
Length, 319½ ft.; 1,747 tons; speed, 21½ knots; Completed, 1934.

**Armament, 4-4-7-in.; 1-3-in. A.A.; 2-17-7-in. torpedo tubes.
280 mines.**

Correction to plan.—Both cranes are fitted abreast the mainmast.

SOVIET UNION.
CRUISER.

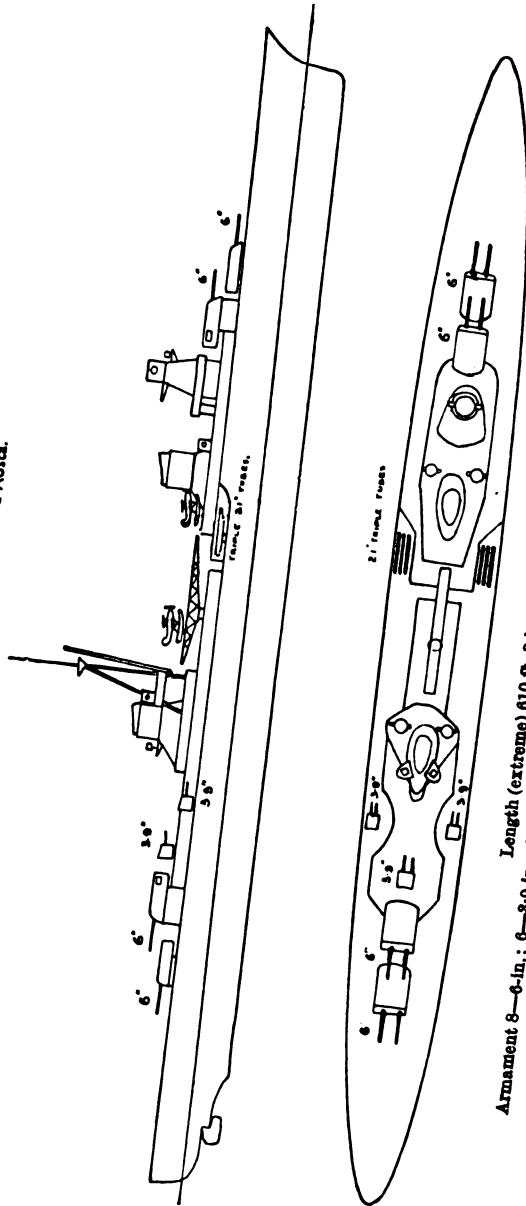
Admiral Makaroff (ex-Nurnberg).



Length, 557 ft. 9 in. ; Displacement, 6,000 tons ; completed 1935.
Armament, 9—5.9-in. ; 8—3.5-in. 8—1.5-in. ; 2 aircraft.

SOVIET UNION.
CRUISER.

"Atendolo" Class
Ex-Italian *Filberto Duca d'Aosta*.

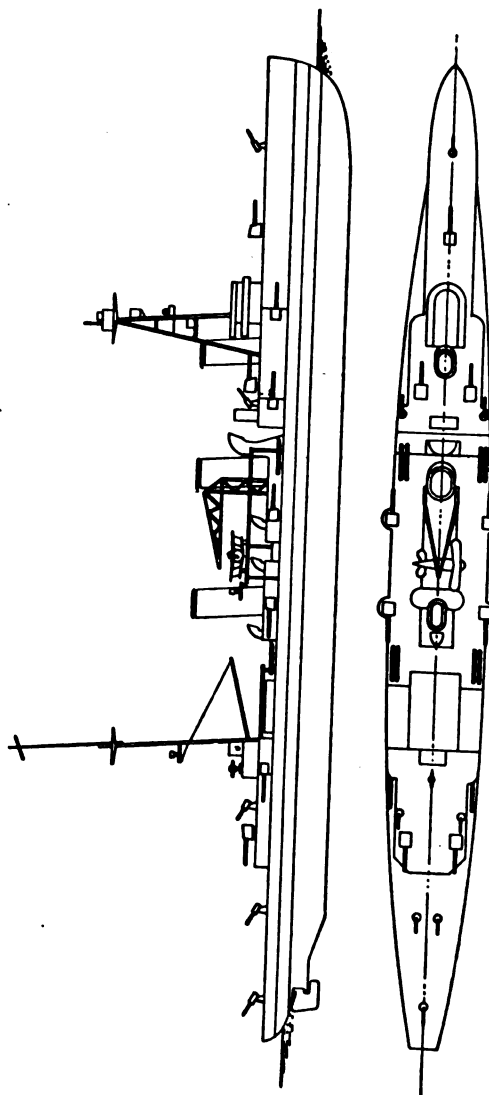


Armament 8—6-in.; 6—3.5-in.; 8—1.5-in. A.A.; 8—0.5-in. A.A.; 2 triple 21-in. torpedo tubes; 1 catapult; 3 aircraft.
Length (extreme) 610 ft. 3 ins.; 7,283 tons; 36½ knots.
Eugenio di Savoia ceded to Greece.

SOVIET UNION.

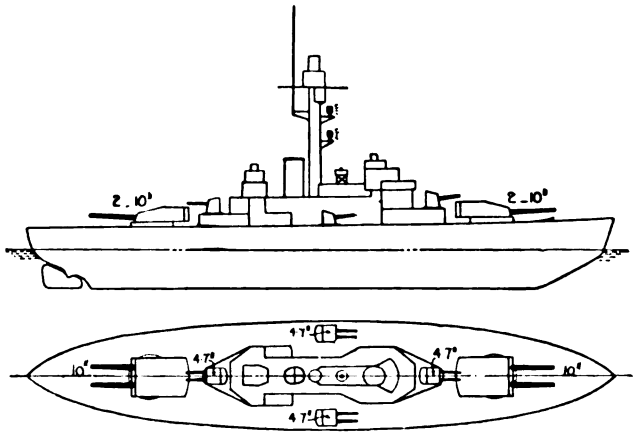
CRUISER.

Krasny Krym (ex-Proflintern).



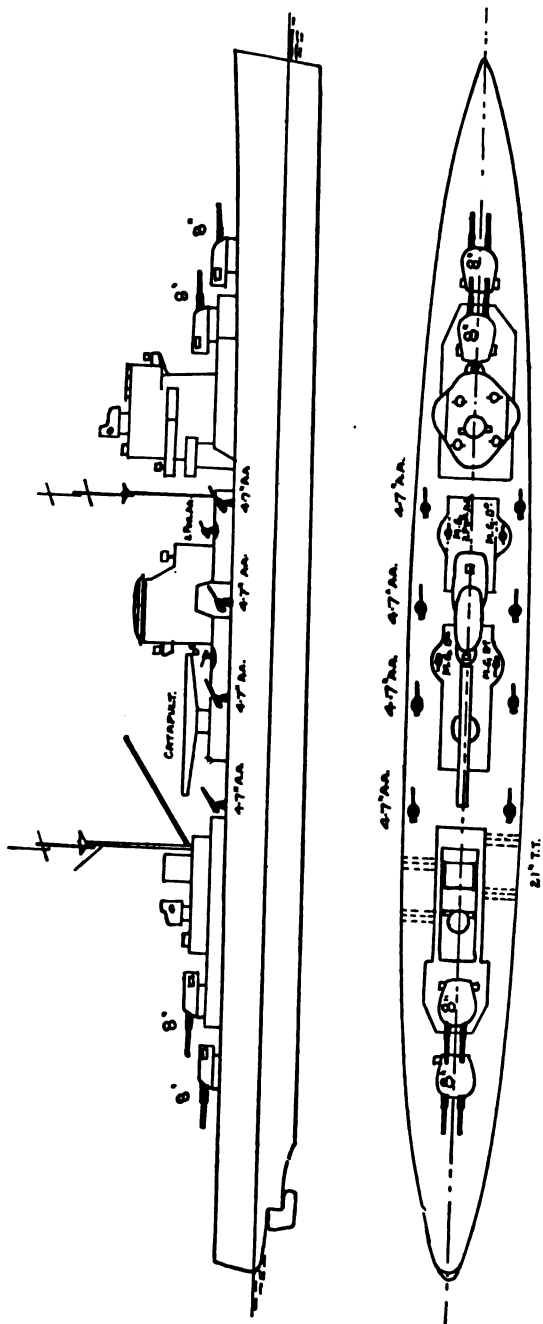
Length, 520 ft. ; Displacement, 7,200 tons ; Speed, 29½ knots ; Completed, 1925.
Armament, 16-5-1-in. ; 4-4-in. ; 4-3-in. A.A. ; 4 M. ; 12-21-in. torpedo tubes ; 100 mines ; 2 seaplanes.

SOVIET UNION.
ARMoured GUNBOAT.
Väinämöinen.



Length, 300 ft. ; 3,900 tons; Speed, 15 knots.
Armament, 4—10-in. ; 8—4'1-in. A.A. ; 4 M.
Completed, 1932—33.

SPAIN.
CRUISER.
Canarias.



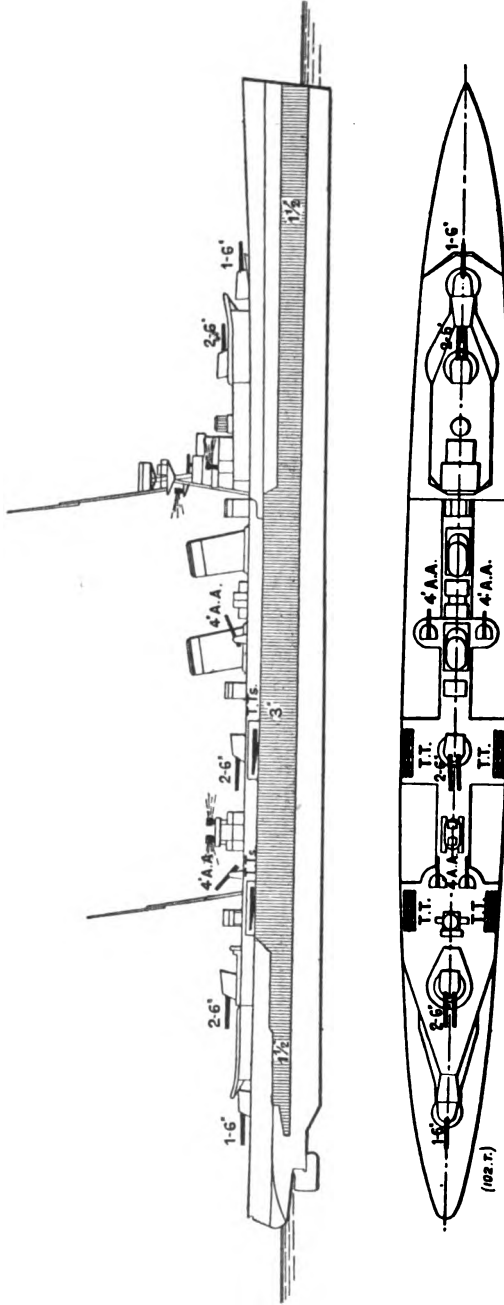
SPAIN.

CRUISERS.

Galicia (ex-Libertad, ex-Principe Alfonso).

Almirante Cervera.

Miguel de Cervantes.



Length (extreme), 579 ft. 6 ins. ; 7,475 tons ; Speed, 33 knots. Completed 1927-1930.

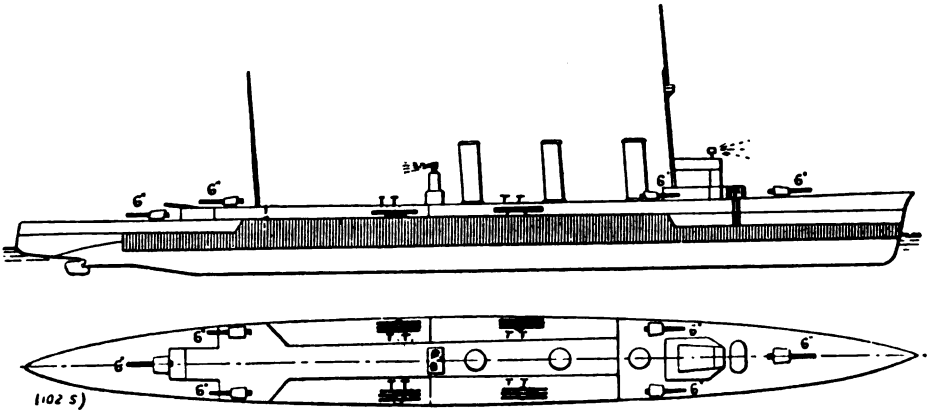
Armament, 8-6-in. ; 4-4-in. A.A. ; 2-3 pr. ; 1 M. ; 4 triple above-water torpedo tubes (21-in. torpedoes).

Corrections to plan.—The mainmast is tripod and has been moved forward. Fore topmast and topgallant mast removed.

SPAIN.

LIGHT CRUISER.

Mendez Nuñez.

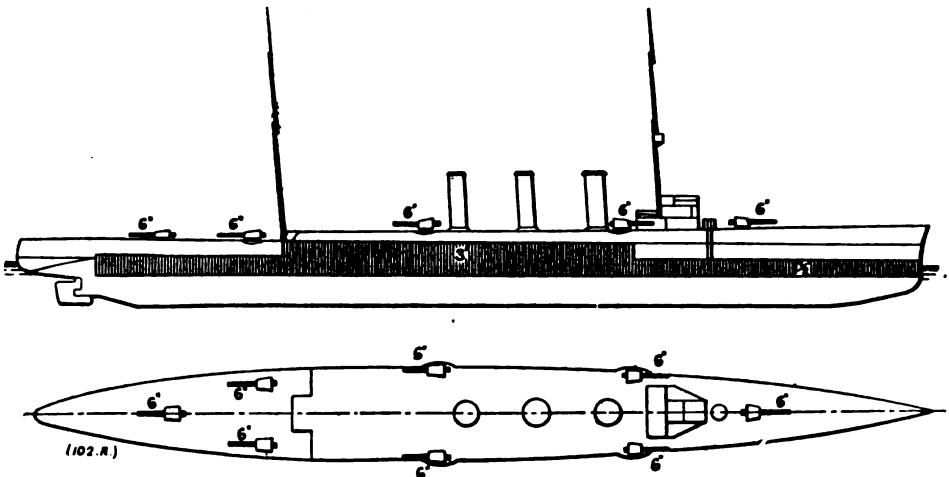


Length (extreme), 462 ft. ; 4,509 tons ; Speed, 29 knots. Completed, 1924.
 Armament, 6—6-in. ; 4—19-in. A.A. ; 4 M. ; 2 above-water triple torpedo tubes (21-in. torpedoes).

NOTE.—The armour belt is 3 ins. thick, tapering to 1½ ins. at the ends.

Corrections to plan.—The foremast is tripod. Fore topgallant mast is fitted.
 A.A. Armament is fitted between second funnel and mainmast. Searchlight platform added round after funnel.

LIGHT CRUISER.

Navarra (*ex-Republica, ex-Reina Victoria Eugenia*).

Length (extreme), 462 ft. ; 4,367 tons ; Speed, 26½ knots ; Completed, 1923.

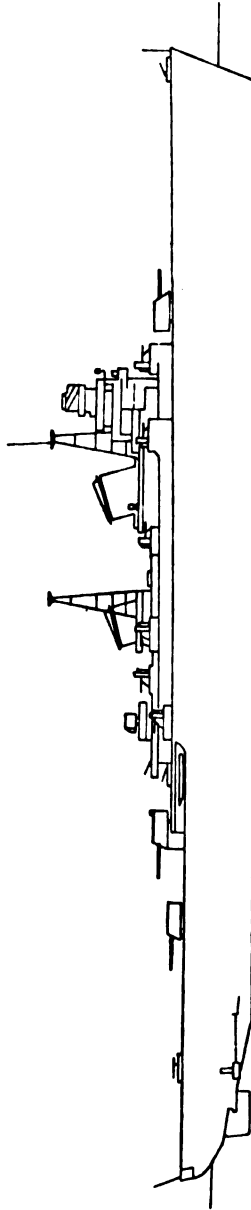
Armament, 8—6-in. ; 4—3.5-in. A.A. ; 4 M. ; 1 L.

Correction to plan.—Foremost funnel and masts removed. Tower built in place of foremast and superstructure built in place of mainmast and fitted with pole masts. A.A. Armament fitted in way of funnels. Upper deck extends further aft.

SWEDEN.

CRUISERS.

Tre Kroner. Gösta Lejon.

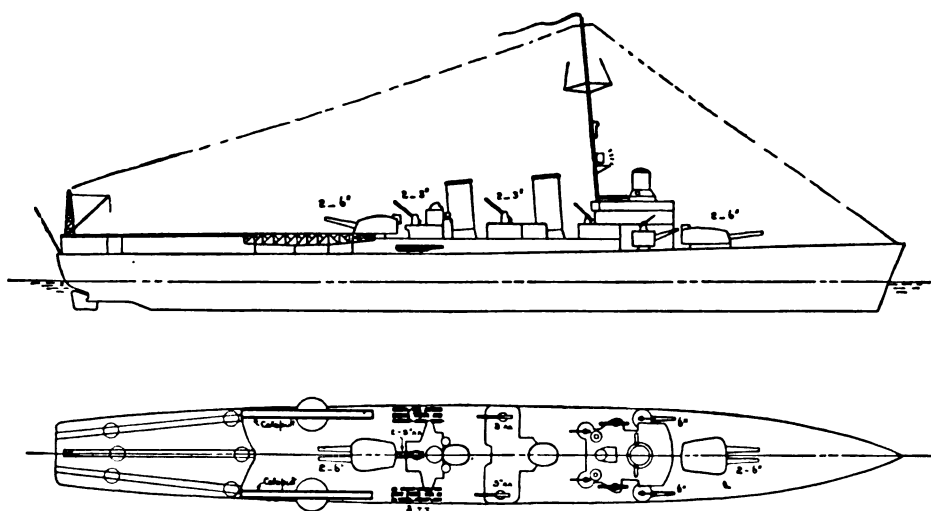


Length 590 ft. 6 in. overall; Standard displacement 7,400 tons; 33 knots.

Armament, 7—6-in.; 20—40-mm. A.A.; 9—20-mm. A.A.; 6—21-in. torpedo tubes.

NOTE.—The tripod masts differ slightly between ships.

SWEDEN.
AIRCRAFT CRUISER.
Gotland.

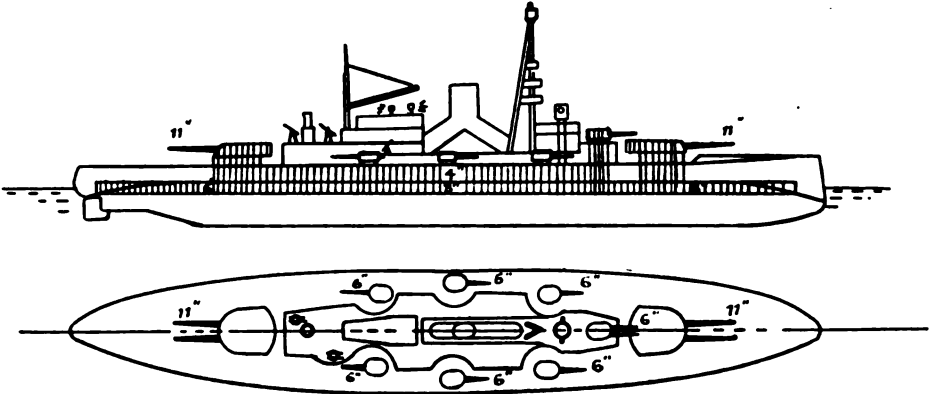


Length, 442 ft. ; 4,700 tons ; Speed, 27 knots ; Completed, 1934.
Armament, 6—6-in. ; 4—3-in. A.A. ; 4 M. ; 6—21-in. torpedo tubes ; 1 catapult ; 11 seaplanes ; 100 mines.
Correction to plan.—Has been reconstructed as an A.A. cruiser.

SWEDEN.

COAST DEFENCE SHIPS.

Gustav V. Sverige.
(As reconstructed 1924-29.)

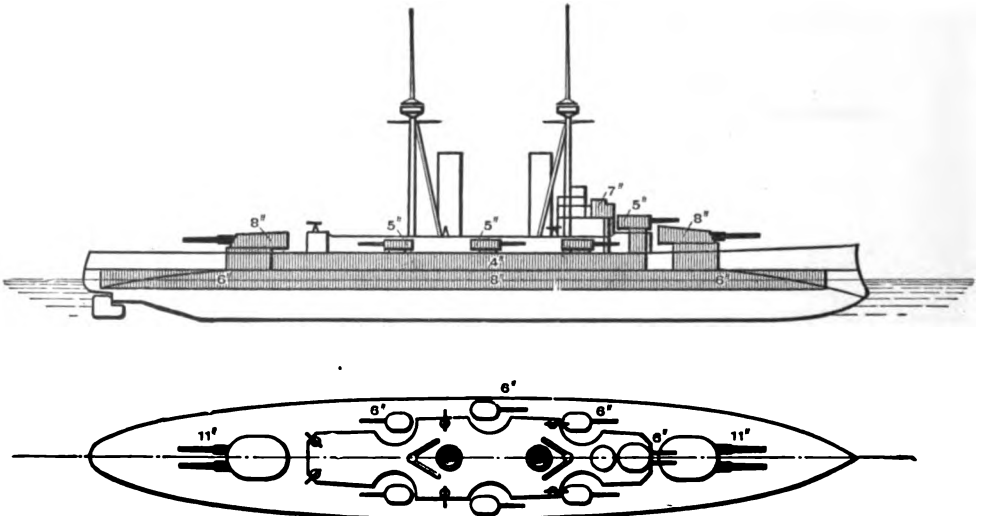


Length, 396.7 ft.; Sverige, 6,899 tons; Gustav V, 7,100 tons; Speed, 23 knots; Completed 1917-21.
Armament, 4—11-in.; 6—5.9-in.; 4—3-in.; 2—6-pr.; 6 M.
Correction to plan.—Mainmast removed. In Sverige two funnels are fitted, the after one being vertical and the forward one bent.

SWEDEN.

COAST DEFENCE SHIP.

Drottning Victoria.



Length, 396.7 ft.; 7,100 tons; Speed, 23 knots; Completed, 1921.
Armament, 4—11-in.; 8—5.9-in.; 4—3-in.; 2—6-pr.; 9 M.
Mainmast removed. Searchlight platform and A.A. guns fitted abaft after funnel.

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a.a.cr. anti-aircraft cruiser ; *a.cr.* armoured cruiser ; *a.g.* armoured gunboat ; *air.c.* aircraft carrier ; *air.cr.* aircraft cruiser ; *air.t.* aircraft tender ; *air.tr.* aircraft transport ; *a.s.* armoured ship ; *a.t.* aviation transport ; *b.* battleship ; *b.cr.* battle cruiser ; *c.d.* coast defence ship ; *cr.* cruiser ; *cr.m.l.* cruiser minelayer ; *d.* destroyer ; *e.c.* escort carrier ; *f.c.d.d.* first-class destroyer ; *f.c.l.t.b.* first-class torpedo-boat ; *f.l.* flotilla leader ; *l.air.c.* light aircraft carrier ; *l.cr.* light cruiser ; *l.f.c.* light fleet carrier ; *m.l.* & *t.s.* minelaying and training ship ; *s.c.d.d.* second-class destroyer ; *s.cr.* scout cruiser ; *sea-p.c.* seaplane carrier ; *tr.cr.* training cruiser.

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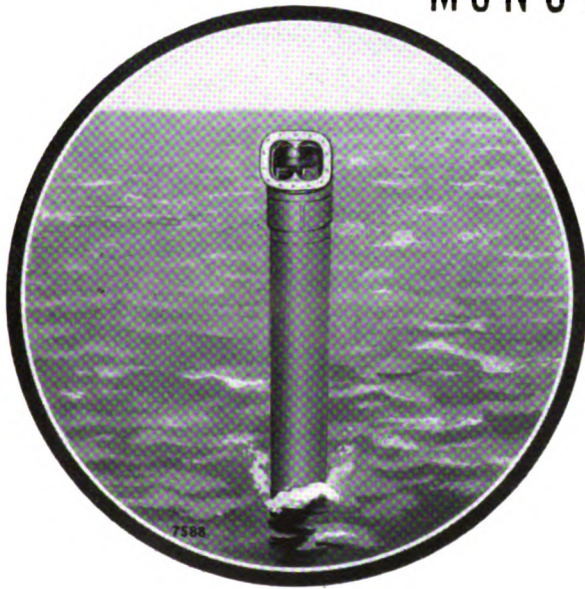
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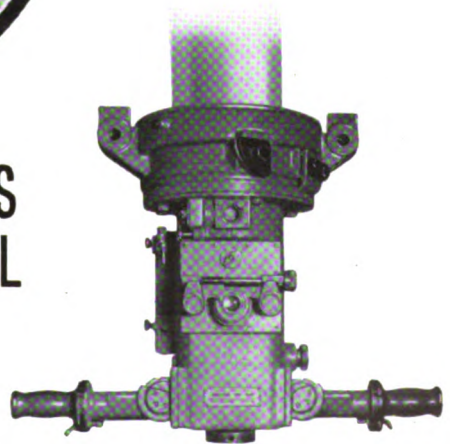
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